



Appendix A

Status of Final Project Inspection



Appendix A

Status of Final Project Inspection

This appendix comprises letters from the Idaho Department of Environmental Quality and the U.S. Environmental Protection Agency documenting their acceptance of the OU 7-10 Glovebox Excavator Method Project standby condition to be satisfactory relative to environmental protection.



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706-1255 • (208) 373-0502

Dirk Kempthorne, Governor
C. Stephen Allred, Director

May 26, 2004

Mr. Jeff Snook, WAG 7 Manager
Environmental Restoration Program
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Ave
Idaho Falls, Idaho 83401-1216

RE: Glovebox Excavator Method (GEM) Facility Final Inspection

Dear Mr. Snook:

The Idaho Department of Environmental Quality (DEQ) performed the standby condition final inspection of the Glovebox Excavator Method Project facility on May 20, 2004. The DEQ considers the standby condition final inspection results to be satisfactory.

Please note that the DEQ may perform another inspection of the GEM facility upon final closure or deactivation, decontamination, and decommissioning of the remaining structure.

Please contact me at (208) 373-0528 should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark K. Clough".

Mark K. Clough, P.E.
GEM Facility Project Manager
Idaho Department of Environmental Quality

MKC:slt

c: Daryl Koch, DEQ WMRD
Dennis Faulk, USEPA Region X
Katie Hain, DOE-ID



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 RICHLAND OFFICE
712 Swift Boulevard, Suite 5
Richland, Washington 99352

June 15, 2004

Mr. Jeff Snook, WAG 7 Manager
Environmental Restoration Program
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, Idaho 834401-1216

Re: Glovebox Excavator Method (GEM) Facility Final Inspection

Dear Mr. Snook:

The U.S. Environmental Protection Agency (EPA) and the Idaho Department of Environmental Quality (DEQ) performed the standby condition final inspection of the Glovebox Excavator Method Project facility on May 20, 2004. At this time the EPA considers the standby configuration to be environmentally protective and no further action is required.

As noted in the DEQ letter, a final inspection of the GEM facility may be required upon final closure.

If you have any questions, feel free to contact me at (509)376-8631.

Sincerely,

Dennis Faulk
WAG 7 Project Manager

cc: Kathie Hain, DOE-ID
Daryl Koch, DEQ

Printed on Recycled Paper





Appendix B

Project History and Operations Chronology

Appendix B

Project History and Operations Chronology

Table B-1 provides a chronology of events associated with the OU 7-10 Glovebox Excavator Method Project remedial action as well as Project accomplishments.

Table B-1. Chronology of events leading up to and through completion of the OU 7-10 Glovebox Excavator Method Project.

OU 7-10 Glovebox Excavator Method Project Event	Date Event Occurred
RWMC became a site for the disposal of radioactive waste.	Early 1950s
Rocky Flats Plant and INEEL waste material was actively placed in OU 7-10 (Pit 9).	November 1967 to June 1969
DOE and EPA enter into a Consent Order and Compliance Agreement.	July 10, 1987
EPA proposed that the INEEL be listed on the National Priorities List (54 FR 48184, 1989).	November 15, 1989
DOE, EPA, and the Idaho Department of Health and Welfare (currently the Idaho Department of Environmental Quality) entered into the FFA/CO (DOE-ID 1991). OU 7-10 was identified for interim action under the FFA/CO.	December 9, 1991
<i>Pit 9 Interim Action ROD</i> (DOE-ID 1993) was signed. DOE management and operating contractor (i.e., EG&G) subsequently subcontracted with Lockheed Environmental Systems and Technologies Company (currently LMAES) to perform the <i>OU 7-10 SOW</i> (EG&G 1993).	October 1, 1993
The 1995 Explanation of Significant Differences (ESD) (DOE-ID1995) was issued.	January 1995
With the possibility that LMAES might not fulfill the terms of the <i>Pit 9 SOW</i> , a meeting was held with DOE Idaho Operations Office, EPA, and the Idaho Department of Health and Welfare resulting in concept formulation for an alternate Pit 9 approach.	July 1997
<i>Revised Pit 9 SOW</i> (LMITCO 1997) was issued thus formalizing the contingency plan prepared by DOE that focused on a staged interim action approach. The <i>Revised Pit 9 SOW</i> identified new performance objectives, milestones, and deliverables in the event that the LMAES contract was not completed.	October 1997
Stage I Work Plan (LMITCO 1998a) was issued meeting enforceable date (March 1998).	March 1998
LMAES subcontract for Pit 9 remediation was terminated.	June 1998
Issued the 1998 <i>ESD to the Pit 9 Interim Action ROD</i> (DOE-ID1998), formalizing the adoption of the three-stage (i.e., Stages I, II, and III) approach to satisfy requirements of the <i>Pit 9 Interim Action ROD</i> (DOE-ID 1993).	September 29, 1998

Table B-1. (continued).

OU 7-10 Glovebox Excavator Method Project Event	Date Event Occurred
<i>OU 7-10 Staged Interim Action Project System Requirements Document</i> (LMITCO 1998b) was issued.	October 22, 1998
<i>Technical and Functional Requirements for the Operable Unit 7-10 Glovebox Excavator Method Project</i> , Revision 1, (INEEL 1999) was issued.	December 16, 1999
Stage II conceptual design submitted to DOE Idaho Operations Office for Agency review.	August 1998
DOE Idaho Operations Office proposed a more simplified Stage II approach.	September 1998
Management and operating contractor (LMITCO) received approval from DOE Idaho Operations Office to proceed on Title I design for Stage II.	October 1998
Completed MSA and DOE Idaho Operations Office line management assessment for Stage I drilling and probing activities.	February 1999
Submitted Stage II Title I (i.e., 30% or preliminary) design to the Agencies, meeting an April 1999 milestone.	March 1999
Stage I probes were successfully inserted in the Pit 9 waste target area without incident. Completed down-hole logging of probes; this logging provided a “fingerprint” of the specific types of waste within this area of Pit 9.	December 1999 through June 2000
Delivered <i>OU 7-10 Staged Interim Action Project, Stage II RD/RA Work Plan</i> (Draft) ^a meeting the June 30, 2000, enforceable date.	June 15, 2000
Completed <i>OU 7-10 Stage I Subsurface Exploration and Treatability Studies Report</i> (Draft). ^b	July 1, 2000
Received Agency comments on the 90% Remedial Design Submittal of Stage II.	August 2000
Prepared and revised Stage II schedule based on resolving Agency comments and an alternate procurement strategy.	September 2000
DOE requested an extension to complete Stage II retrieval activities (from 88 months to 149 months).	February 2001
Regulators denied DOE’s schedule extension request.	March 2001
DOE invoked formal dispute notification under Paragraph 9.1 of the FFA/CO.	March 2001
Dispute was elevated to the Senior Executive Committee.	March 2001
Idaho DEQ director issued memorandum decision and order stating that the extension request did not form a basis of good cause.	July 2001
A meeting was held in Boise to negotiate resolution to Pit 9 dispute. DOE proposed the glovebox excavator method approach for an expeditious completion of Stage II no later than October 2004.	September 2001
The <i>Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications</i> (INEEL/EXT-01-01105) was issued recommending the glovebox excavator	October 1, 2001

Table B-1. (continued).

OU 7-10 Glovebox Excavator Method Project Event	Date Event Occurred
method as the best option for a retrieval demonstration. This report proposed modified objectives for Stage II.	
Work was initiated on a conceptual design for the Project.	October 2001
Issued <i>OU 7-10 Glovebox Excavator Method Technical and Functional Requirements</i> (INEEL 1999) document and <i>OU 7-10 Glovebox Excavator Method Project Conceptual Design Report for Critical Decision 1</i> (INEEL 2002). This submittal documented modified objectives for Stage II.	January 2002
DOE submits notification of CD-1 approval for the Project. Authorization is given to proceed from conceptual design to title design.	February 12, 2002
BBWI and DOE-ID responded to Agency comments on the conceptual design (i.e., CD-1) package. No outstanding issues were identified regarding comment resolution.	March 18, 2002
DOE approved CD-3a – early procurement of long-lead items and site development package for the Project. Submitted CD-3a design output documents to the Agencies for review.	April 18, 2002
<i>Agreement to Resolve Disputes</i> (DOE-ID 2002a) signed. This agreement reconfirmed the glovebox excavator method as the path forward for accomplishing Stage II.	April 18, 2002
DOE approved CD-3b – facility package for the Project.	May 20, 2002
CD-3b design output documents submitted to the Agencies for review.	May 21, 2002
Commenced Project site preparation and development construction work.	June 2002
DOE approved CD-2/3, balance of design for the Project. BBWI authorized to proceed with full procurement and construction activities meeting the August 30, 2002, enforceable date.	June 26, 2002
Completed and submitted the <i>Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project</i> (Salomon et al. 2002), <i>Data Quality Objectives for the OU 7-10 Glovebox Excavator Method Project</i> (McIlwain 2002), and <i>Excavation Plan and Sequential Process Narrative for the OU 7-10 Glovebox Excavator Method Project</i> (Jamison and Preussner 2002) for Agency review.	July 11, 2002
Completed Project site preparation and development construction work.	July 25, 2002
Commenced structural construction activities marking the official start of Project construction.	July 30, 2002
CD-2/3 design output documents submitted to the Agencies for review.	July 31, 2002
Placed shoring box into trenched location at the Pit 9 site. Subsequently commenced construction of the facility floor structure.	August 3, 2002
BBWI submitted a baseline change proposal to DOE-ID to address scope change that included self-storage of processed waste rather than sending the waste to the	August 2002

Table B-1. (continued).

OU 7-10 Glovebox Excavator Method Project Event	Date Event Occurred
Advanced Mixed Waste Treatment Facility Project.	
Commenced installation of the RCS.	September 2002
Submitted the <i>Remedial Design Package for the OU 7-10 Glovebox Excavator Method Project</i> (DOE-ID 2002b) to the Agencies for review meeting the October 31, 2002, enforceable date.	October 1, 2002
Submitted the <i>Remedial Design Supplemental Package for the OU 7-10 Glovebox Excavator Method Project</i> (DOE-ID 2002c) to the Agencies for review.	October 15, 2002
Commenced construction of the WES and submitted notification to Idaho DEQ and EPA.	November 2002
Project team assigned work location at the RWMC.	November 2002
Conducted MSA for startup of CTP-S mockup facility.	November 2002
Completed structural construction activities (e.g., WES and RCS).	December 1, 2002
BBWI and DOE-ID responded to Agency comments on the Remedial Design package (DOE-ID 2002b).	December 6, 2002
Began procedure and process validation activities at CTP-S.	December 2002
BBWI and DOE-ID responded to Agency comments on the Remedial Design supplemental package.	January 8, 2003
Commenced installation of the PGS.	January 2003
Commenced operator training program activities.	February 2003
Commenced installation of backhoe into RCS wall structure.	February 17, 2003
Completed installation of backhoe.	March 17, 2003
Completed installation, sealing, and testing of the RCS and WES structures.	April 14, 2003
Completed construction of the Project facility and installation of process equipment.	May 13, 2003
Initiated testing of facility equipment and systems.	May 2003
Completed operator and supervisor evaluations in support of final qualification.	July 2003
Completed MSA. (Note: Two MSAs were conducted, one in August 2003 and the other October 13-17, 2003.)	August through October 2003
Completed Agency prefinal inspection. (Note: The Agency prefinal inspection was conducted in two visits, August 4–6, 2003, and November 4, 2003.)	August through November 2003
Completed contractor ORR. (Note: Contractor ORR review was held October 7 through November 5, 2003.)	November 5, 2003

Table B-1. (continued).

OU 7-10 Glovebox Excavator Method Project Event	Date Event Occurred
Completed DOE line management assessment. (Note: DOE line management assessment review was held November 3-13, 2003.)	November 13, 2003
Completed DOE ORR. (Note: DOE ORR was conducted December 1–5, 2003, and closed December 10, 2003.)	December 10, 2003
Received letter of approval, to commence Project operations, signed and issued by DOE Idaho Operations Office in advance of the enforceable date of February 28, 2004.	December 11, 2003
Operations event of note: Began excavation at the Project site (overburden removal), meeting the March 31, 2004, enforceable date.	December 12, 2003
Operations event of note: Completed removal of overburden.	December 19, 2003
Operations event of note: Began retrieval of waste zone material.	January 5, 2004
Operations event of note: First debris observed.	January 23, 2004
Operations event of note: Example occurrence of probe pulling and movement (21:31, Cameras 1, 2, 3, and 4).	February 8, 2004
Operations event of note: Example occurrence of graphite waste retrieval (08:49, Camera 2). Example occurrence of graphite waste processing (09:07, Camera 6). Example occurrence of debris retrieval (09:10, Camera 2). Example occurrence of debris processing (09:25, Camera 5). Example occurrence of air sampling (08:56, Cameras 1 and 7).	February 14, 2004
Operations event of note: Example occurrence of underburden coring (10:57-13:45, Cameras 1, 2, 3, and 4)	February 20, 2004
Completed retrieval of 57 m ³ (75 yd ³), meeting the October 31, 2004, enforceable date. Waste zone retrieval operations ended.	February 21, 2004
Commenced warm standby transitional activities (i.e., shutdown).	March 18, 2004
Backfilled the excavation area with grout (first lift).	March 25, 2004
Backfilled the excavation area with grout (second lift).	March 31, 2004
Facility commences warm standby period.	April 8, 2004
Facility final inspection by the Agencies.	May 20, 2004

Table B-1. (continued).

OU 7-10 Glovebox Excavator Method Project Event		Date Event Occurred
a. DOE-ID, 2000, "Draft Operable Unit 7-10 (OU 7-10) Staged Interim Action Project, Stage II, RD/RA Work Plan Primary Deliverable Submittal (Draft)," DOE/ID-10767, Binder I-A, "Remedial Design/Remedial Action Work Plan for Stage II of the Operable Unit 7-10 (OU 7-10) Staged Interim Action Project," DOE Idaho Operations Office.		
b. INEEL, 2000, "OU 7-10 Stage I Subsurface Exploration and Treatability Studies Report (Draft)," INEEL/EXT-2000-00403, Rev. 0 Draft, INEEL.		
CD	critical decision	
CTP-S	Cold Test Pit-South	
DEQ	[Idaho] Department of Environmental Quality	
DOE	U.S. Department of Energy	
EPA	U.S. Environmental Protection Agency	
ESD	explanation of significant differences	
FFA/CO	Federal Facility Agreement and Consent Order	
FFS	Facility Floor Structure	
INEEL	Idaho National Engineering and Environmental Laboratory	
LMAES	Lockheed Martin Advanced Environmental Systems	
LMITCO	Lockheed Martin Idaho Technologies Company	
MSA	management self-assessment	
ORR	operational readiness review	
OU	operable unit	
PGS	Packaging Glovebox System	
RCS	Retrieval Confinement Structure	
ROD	record of decision	
RWMC	Radioactive Waste Management Complex	
SOW	scope of work	
WES	Weather Enclosure Structure	

REFERENCES

- 54 FR 48184, 1989, "National Priorities List of Uncontrolled Hazardous Waste Sites; Final Rule," *Federal Register*, U.S. Environmental Protection Agency.
- DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, Administrative Docket No. 1088-06-29-120, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare.
- DOE-ID, 1993, *Record of Decision: Declaration for Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory*, Administrative Record No. 5569, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; and Idaho Department of Health and Welfare.
- DOE-ID, 1995, *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory*, Administrative Record No. 5862, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; and Idaho Department of Health and Welfare.
- DOE-ID, 2002a, *Agreement to Resolve Disputes, the State of Idaho, United States Environmental Protection Agency, United States Department of Energy*, U.S. Department of Energy, State of Idaho, U.S. Environmental Protection Agency.
- DOE-ID, 2002b, *Remedial Design Package for the OU 7-10 Glovebox Excavator Method Project*, DOE/ID-11032, Rev. 0, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2002c, *Remedial Design Supplemental Package for the OU 7-10 Glovebox Excavator Method Project*, DOE/ID-11032-Suppl, Rev. 0, U.S. Department of Energy Idaho Operations Office.
- EG&G, 1993, *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: OU 7-10 Pit 9 Project Interim Action*, EGG-ER-11055, Rev. 0, Idaho National Engineering and Environmental Laboratory.
- INEEL, 1999, *Technical and Functional Requirements Document for Stage 2 for the OU 7-10 Staged Interim Action Project*, INEEL/EXT-1998-00444, Rev. 1, Idaho National Engineering and Environmental Laboratory.
- INEEL, 2002, *OU 7-10 Glovebox Excavator Method Project Conceptual Design Report for Critical Decision 1*, INEEL/EXT-01-01512, Idaho National Engineering and Environmental Laboratory.
- Jamison, R. Kirt and Brian D. Preussner, 2002, *Excavation Plan and Sequential Process Narrative for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-02-00703, Rev. 0, Idaho National Engineering and Environmental Laboratory.
- LMITCO, 1997, *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit 7-10 (Pit 9 Project Interim Action)*, INEL-94/0110, Rev. 2, Idaho National Engineering and Environmental Laboratory.

LMITCO, 1998a, *Work Plan for Stage I of the Operable Unit 7-10 Contingency Project*, DOE/ID-10623, Rev. 0, Idaho National Engineering and Environmental Laboratory.

LMITCO, 1998b, *OU 7-10 Staged Interim Action Project System Requirements Document*, INEEL/EXT-98-00310, Rev. 1, Idaho National Engineering and Environmental Laboratory.

McIlwain, Beth A., 2003, *Data Quality Objectives for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-02-00660, Rev. 2, Idaho National Engineering and Environmental Laboratory.

Salomon, Hopi, Daryl R. Haefner, Beth A. McIlwain, Jila Banaee, Jeffrey J. Einerson, and Anna K. Podgorney, 2003, *Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-02-00542, Rev. 2, Idaho National Engineering and Environmental Laboratory.

TFR-2527, 2002, "Technical and Functional Requirements for the OU 7-10 Glovebox Excavator Method Project," Rev. 3, Idaho National Engineering and Environmental Laboratory.



Appendix C

List of Glovebox Excavator Method Procedures and Emergency, Abnormal Operating, and Alarm Response Procedures

Appendix C

List of Glovebox Excavator Method Procedures and Emergency, Abnormal Operating, and Alarm Response Procedures

Table C-1 contains a list of various procedures and emergency alarm response procedures (EARs), and applicable revision of each, that were developed and used for the OU 7-10 Glovebox Excavator Method Project facility operations. Other company-wide procedures were used, as appropriate, that are not identified herein. The procedures listed here are available at Web Page:
<http://train1.inel.gov/ou710/idms/index.cfm/>.

Table C-1. Emergency, abnormal operating, and alarm response procedures, technical procedures, and management control procedures.

Procedure, Year Issued	Title, Revision	Summary Description
EAR-102, 2003	“OU 7-10 - Respond to Loss of Commercial Power,” Rev. 4	Emergency response instructions and actions in case commercial power failed only at WMF-671 (OU 7-10 Glovebox Excavator Method Project facility).
EAR-104, 2003	“OU 7-10 - Inability to Maintain RCS Pressure Differential,” Rev. 4	Emergency response instructions and actions in case of ventilation loss.
EAR-105, 2003	OU 7-10 - Respond to Uncontrolled Confinement Breach or Breached Drum,” Rev. 5	Emergency response instructions and actions in case of confinement structure or equipment breach.
EAR-108, 2003	“OU 7-10 - Respond to Fire,” Rev. 6	Emergency response instructions and actions in case a fire occurred in the WES, RCS or in a PGS.
EAR-109, 2003	“OU 7-10 -Respond to Dropped Drum,” Rev. 5	Emergency response instructions and actions in case a filled drum was dropped or breached and drum containment fails.
EAR-123, 2003	“OU 7-10 -Respond to Operations Advisory Alarm,” Rev. 2	Alarm response instructions and actions for operational advisory alarm activated at WMF-671.
EAR-127, 2003	“OU 7-10 - Respond to a Criticality Alarm,” Rev. 2	Emergency response instructions and actions in case a criticality alarm sounded from activities conducted in the RCS or in a packaging glovebox.

Table C-1. (continued).

Procedure, Year Issued	Title, Revision	Summary Description
EAR-128, 2003	“OU 7-10 - Respond to a Drum Explosion,” Rev. 2	Emergency response instructions and actions in case a drum exploded or catastrophically failed.
EAR-129, 2003	“OU 7-10 - Respond to Loss of Ventilation Fans,” Rev. 2	Emergency response instructions and actions in case main exhaust fan HV-FAN-1 or -2 failed if waste zone material was exposed.
EAR-675, 2003	“Respond to Loss of Commercial Power-RWMC,” Rev. 4	Emergency response instructions and actions in case commercial power failed through all of RWMC.
EAR-676, 2004	“Abnormal Radiological Situations,” Rev. 6	Emergency response instructions and actions in case a radiological spill occurred, or a CAM or RAM activated, or a CAS activated.
MCP-1311, 2003	“OU 7-10 Management of Operational Models,” Rev. 4	Instructions for managing operational modes in WMF-671; implemented limiting conditions for operations and actions required to move between operational modes in portions of PGS 1, 2, or 3; the RCS; or the entire WMF-671 facility.
MCP-135, 2003	“Creating, Modifying, and Canceling Procedures and Other DMCS-Controlled Documents,” Rev. 14	Describes planning, development, review, and approval needed to produce DMCS-controlled documents that are technically correct, usable, and controlled.
MCP-1754, 2003	“OU 7-10 Validation of Gamma Assay Results,” Rev. 3	Process for verifying and validating gamma assay measurements and results for OU 7-10 (i.e., Pit 9) packaged waste.
MCP-1827, 2003	“OU 7-10 General Precautions, Limitations, and Prerequisites,” Rev. 1	Precautions and limitations and prerequisites for safely and correctly performing operations procedures.
MCP-2985, 2004	“Chapter XVI - Operations Procedures,” Rev. 4	Minimum standards for preparation, approval, and control of operating procedures.
MCP-3236, 2004	“Supplemental Procedure to MCP-2985, Operations Procedures,” Rev. 11	Applies to RWMC operations activities that required specific direction for operating systems and equipment to ensure the facility was operated within the design basis and to support safe and reliable operation of the facility. The applicable NFM or alternate was responsible for implementing MCP-2985 at RWMC.

Table C-1. (continued).

Procedure, Year Issued	Title, Revision	Summary Description
TPR-1697, 2004	“Waste Handling and Overpacking in Approved RCRA/CERCLA Storage Areas,” Rev. 52	Operators used this TPR when transferring waste within the storage areas and between storage areas. It was also used when moving waste within the vestibule and main body of WMF-671.
TPR-1788, 2003	OU 7-10 - Set Up and Operate the Stand by Power System,” Rev. 2	Operators used this TPR to test, operate, and maintain the WMF-671 facility standby generator.
TPR-1789, 2003	“OU 7-10 - Repackaging Drums,” Rev. 2	Operators used this TPR to repackage (returned) drums at WMF-671. (NOTE: This TPR was developed but never used.)
TPR-1792, 2003	“OU 7-10 - Handle and Remove Overburden,” Rev. 7	Operators used this TPR to remove the excavation pit overburden soil, not to retrieve waste.
TPR-1793, 2003	“OU 7-10 - Retrieve Waste,” Rev. 8	Operators used this TPR to remove waste from the excavation site.
TPR-1794, 2004	“OU 7-10 Waste Handling, Sampling, and Packaging,” Rev. 8	Operators used this TPR to handle, sort, sample, and package waste in the PGS.
TPR-1795, 2004	“OU 7-10 Drum-In Materials and Drum Changeout,” Rev. 9	Operators used this TPR to use the drum loadout enclosure to drum-in PGS supplies and to changeout loaded drums.
TPR-1796, 2003	“OU 7-10 - Glove Change-Out Operations,” Rev. 4	Operators used this TPR to change out the PGS and RCS gloves.
TPR-1797, 2004	“OU 7-10 - Waste Sample Storage and Transfer,” Rev. 7	Operators used this TPR to store samples (from the PGS) and prepare said samples for transportation.
TPR-1798, 2004	“OU 7-10 - Underburden Sampling and Sample Transfer,” Rev. 5	Operators used this TPR when pulling an underburden sample, packaging the sample, and preparing it for transportation.
TPR-1799, 2004	“OU 7-10 Bag-in/Bag-out Operations,” Rev. 6	Operators used this TPR for bagging items into and out of the PGS, RCS, and the smear-counting glovebox.
TPR-1801, 2003	“OU 7-10 - Set Up and Operate the Dust Suppression System,” Rev. 6	Operators used this TPR to set up and operate the DSS.
TPR-1802, 2004	“OU 7-10 - Set Up and Operate the CCTV System,” Rev. 6	Operators used this TPR to set up and operate the CCTV recording system.

Table C-1. (continued).

Procedure, Year Issued	Title, Revision	Summary Description
TPR-1803, 2003	“OU 7-10 - Operate the Fissile Material Monitor,” Rev. 5	Operators used this TPR to set up and operate the FMM.
TPR-1804, 2003	“OU 7-10 - Drum Assembly,” Rev. 5	Operators used this TPR to build clean drum assemblies.
TPR-1805, 2003	“OU 7-10 Set Up and Operate Emissions Monitoring System,” Rev. 9	Operators used this TPR to prepare the emissions monitoring system for use.
TPR-1806, 2003	“OU 7-10 Operation of the Ventilation System,” Rev. 7	Operators used this TPR to prepare the ventilation system for use.
TPR-1807, 2003	“OU 7-10 Operation of the Gamma Spectroscopy System,” Rev. 6	Operators used this TPR to operate the drum assay system.
TPR-1818, 2003	“OU 7-10 Excavator Fueling and Fuel Delivery at the CTP-S and WMF-671,” Rev. 3	Procedure to support needed excavator fueling at both the CTP-S and at WMF-671.
CAM	constant air monitor	
CAS	criticality alarm system	
CCTV	closed-circuit television	
CTP-S	Cold Test Pit – South	
DMCS	document management control system	
DSS	Dust Suppression System	
EAR	emergency alarm response procedure	
FMM	fissile material monitor	
HMI	human machine interface	
MCP	management control procedure	
NFM	nuclear facility manager	
OU	operable unit	
PGS	Packaging Glovebox System	
RAM	remote air monitor	
RCS	Retrieval Confinement Structure	
RWMC	Radioactive Waste Management Complex	
TPR	technical procedure	



Appendix D

Blank Radioactive Waste Management Complex Forms

Appendix D

Blank Radioactive Waste Management Complex Forms

Work performed for the OU 7-10 Glovebox Excavator Method Project was recorded, as appropriate, on the Radioactive Waste Management Complex forms included in this appendix. Forms included in this appendix were developed and used for the Project facility operations. Other company-wide forms were used, as appropriate, that are not identified herein. Completed forms are maintained in the Project File at the Radioactive Waste Management Complex.

FRM-152
OU 7-10 Operations Excavation Inspection

Date: _____ Time: _____

Supervisor/Foreman at Excavation: _____

Competent Person: _____ Location: _____

(Check appropriate response-provide additional comment where deficiencies exist. If deficiencies are found, contact the Operations Foreman and the Shift Supervisor.)

Use this section during Overburden Removal (N/A section as appropriate.) ☐ N/A YES NO N/A

1. Materials and equipment are located at least two ft from edge of shoring box?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Signage is appropriate and posted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Barricades are erected around excavation perimeter when personnel are in the RCS?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Access and egress is spaced no more than 25 ft when personnel are working inside the excavation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use this section during Waste Retrieval (N/A section as appropriate.) ☐ N/A YES NO N/A

1. Shoring box is in good condition based on visual inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Excavation sides are free of water seepage and bottom is free of standing water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Excavation is free of sloughing or caving that may undercut the shoring box?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. No tremors or quakes have been reported that may affect the excavation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Observations Comments

I hereby attest that the following conditions existed and that the preceding items were checked or reviewed during this inspection. (Provide additional comments where deficiencies exist.)

Competent Person: _____

Signature
Date
Time

FRM-154
OU 7-10—WMF-671 TSR AND SAR SURVEILLANCE DATA

Document

Opened: _____

Shift Supervisor (SS)

Date: _____

Instructions:

1. TSR data is taken at the beginning of the 0700 and 1900 shifts and is not required to be completed before normal operations begin.
2. Document deficiencies in the comments section and inform the Operations Foreman (OF).
3. For readings that are outside the normal range or does not meet the condition listed in the NORM column of inspection sheet, inform the OF and SS, who will evaluate actions necessary to return the reading to its normal range or condition and perform the following:
 - A. Log the actual value and circle in black ink.
 - B. Mark with an identifying number.
 - C. Record the following information in the comments section:
 - Identifying number
 - OF/SS notified
 - Reason for the out-of-specification reading
 - Corrective action taken
 - Results of corrective action and new in-specification value.
4. For any reading that is below the MIN or above the MAX listed in the respective column, notify the OF and SS immediately and perform the following:
 - A. Record in black ink the actual value
 - B. Circle the reading in red
 - C. Mark with an identifying number
 - D. Record in black ink the following information in the comments section:
 - Identifying number
 - Reason for the abnormal reading
 - OF/SS notified
 - Corrective action taken

	TIME:			MON	TUE	WED	THU
				0800	0800	0800	0800
	MIN	NORM	MAX				
Criticality Alarm System, CA-RIA-1							
Station indicator #1 Readout (in mREM/h) (TSR)	N/A	0.4-0.8	N/A				
Station indicator #2 Readout (in mREM/h) (TSR)	N/A	0.4-0.8	N/A				
Station indicator #3 Readout (in mREM/h) (TSR)	N/A	0.4-0.8	N/A				
1 st voting module indicating switch (TSR)	N/A	Active	N/A				
2 nd voting module indicating switch (TSR)	N/A	Active	N/A				
Power supply module #1 AC power (green LED) (TSR)	N/A	ON	N/A				
Power supply module #2 AC power (green LED) (TSR)	N/A	ON	N/A				
Ventilation System							
HV-PDIT-1 RCS to WES differential pressure (See below note.) (TSR)	-0.6	-0.8 – -1.5	-4.0				
↑ NOTE: Differential pressure gauge will read negative. A negative reading within approved min and max verifies a differential pressure of equal to greater than 0.6 and less than or equal to 4.0 iwg between the RCS and WES. ↑							

D-8

	TIME:			MON	TUE	WED	THU
				0800	0800	0800	0800
	MIN	NORM	MAX				
General Housekeeping							
Inspect for wood rags rubbish and other combustibles and remove from building as appropriate. (SAR)	N/A	N/A	N/A				
PGS — all							
PGS #1 Enclosure tent combustible supplies limited to those necessary to support a single shift of operations and excess waste removed; as viewed through the tent windows. (SAR)	N/A	N/A	N/A				
PGS #1 Area marked outside tent below platform is free from storage of combustible materials. (SAR)	N/A	N/A	N/A				
PGS #2 Enclosure tent combustible supplies limited to those necessary to support a single shift of operations and excess waste removed; as viewed through the tent windows. (SAR)	N/A	N/A	N/A				
PGS #2 Area marked outside tent below platform is free from storage of combustible materials. (SAR)	N/A	N/A	N/A				
PGS #3 Enclosure tent combustible supplies limited to those necessary to support a single shift of operations and excess waste removed; as viewed through the tent windows. (SAR)	N/A	N/A	N/A				
PGS #3 Area marked outside tent below platform is free from storage of combustible materials. (SAR)	N/A	N/A	N/A				

	TIME:			MON	TUE	WED	THU
				0800	0800	0800	0800
	MIN	NORM	MAX				
RCS Outlet HEPA Filters							
HV-PDI-40 (Prefilter in iwg) (SAR)	0.20	N/A	2.5				
HV-PDI-41 (Prefilter in iwg) (SAR)	0.20	N/A	2.5				
HV-PDI-42 (Prefilter in iwg) (SAR)	0.20	N/A	2.5				
HV-PDI-43 (Exhaust HEPA in iwg) (SAR)	0.40	N/A	2.5				
HV-PDI-44 (Exhaust HEPA in iwg) (SAR)	0.40	N/A	2.5				
HV-PDI-45 (Exhaust HEPA in iwg) (SAR)	0.40	N/A	2.5				
HV-PDI-46 (Exhaust HEPA in iwg) (SAR)	0.40	N/A	2.5				
HV-PDI-47 (Exhaust HEPA in iwg) (SAR)	0.40	N/A	2.5				
HV-PDI-48 (Exhaust HEPA in iwg) (SAR)	0.40	N/A	2.5				
Closed-circuit television from previous shift’s recording is backed up per TPR-1802, Set Up and Operate the CCTV System	N/A	N/A	N/A				

D-10

	MON	TUE	WED	THU
TIME	0800	0800	0800	0800
Time completed — if not within one-hour of specified time				
Performer				
Operations Foreman Review				

Comments:

Document Closed: _____

SS

Date: _____

FRM-157 OU 7-10 RadCon Routines

Directions: Fill in the month and year and the date blanks.
Place initials in the appropriate blank as each task is completed.
If a task is not completed due to out-of-service equipment, write "OOS" in the proper space.

Month/Year:																																			
REQUIREMENT	DATE																																		
	DAY	M	T	W	TH	F	S	S	M	T	W	TH	F	S	S	M	T	W	TH	F	S	S	M	T	W	TH	F	S	S	M	T	W	TH	F	S
CONTAINMENT	PGS #1 0800 (SAR)																																		
INSPECTION	PGS #2 1300 (SAR)																																		
CHECKS	PGS #3 2000 (SAR)																																		
COMPLETED	RCS 1700 (SAR)																																		
	RCT GLOVE BOX 1600																																		
	WMF-671 HEPA SYSTEM #1 (SAR)	RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____													
	WMF-671 HEPA SYSTEM #2	RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____				RCT _____ DATE _____													
Weekly Supervisory Review																																			

CHECKLIST APPROVED BY (SIGNATURE/DATE) _____

END OF MONTH REVIEW (SIGNATURE/DATE) _____

FRM-158-OU 7-10 RADIOLOGICAL SURVEY REPORT FOR HEPA SYSTEM #1

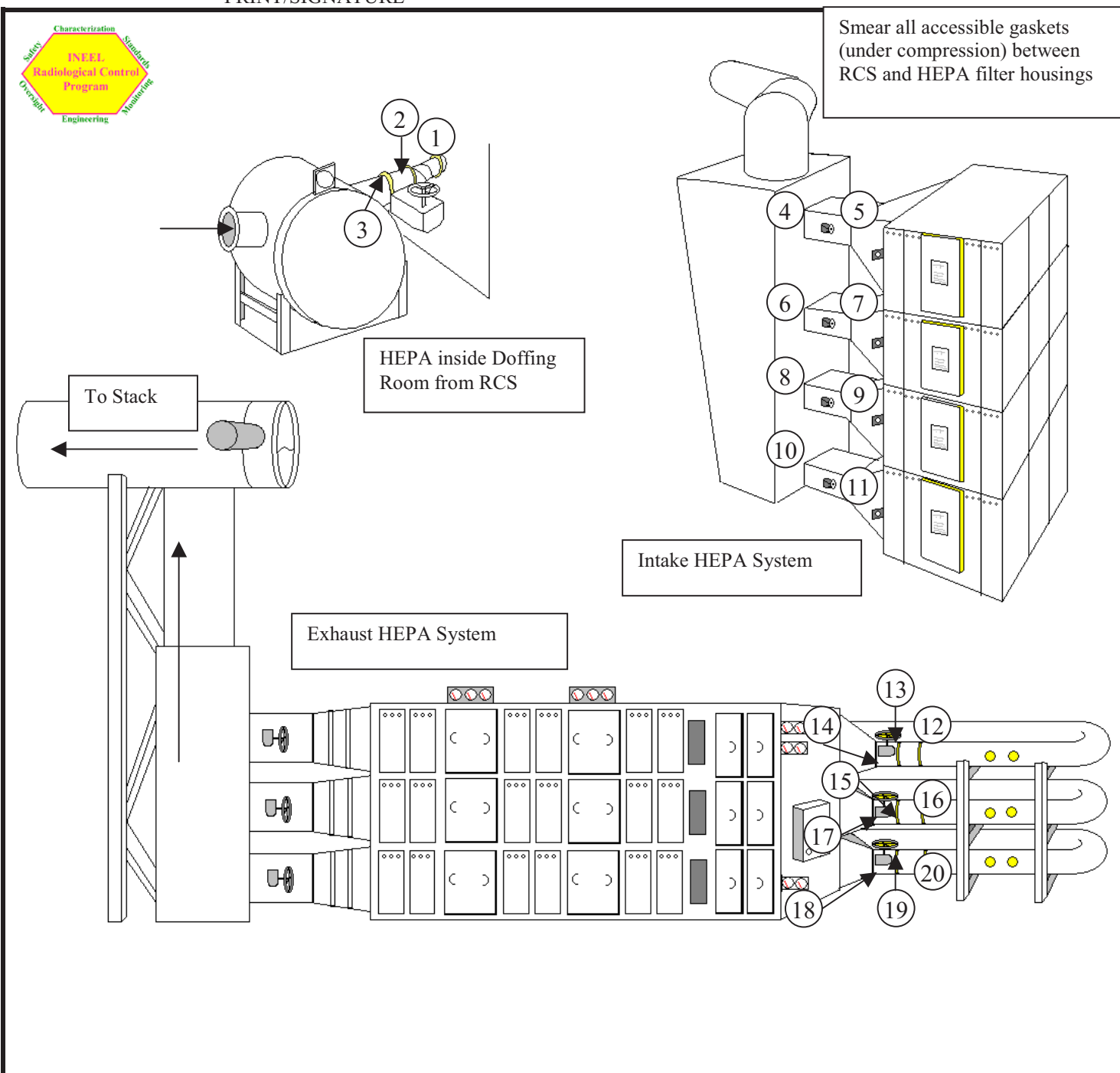
UFC: 5303

BARCODE #

BLDG.: WMF-671
AREA/ROOM: WES
RWP #:
LOG #:
DATE:
TIME:

☒ ROUTINE **JOB DESCRIPTION**
☐ NON ROUTINE (SPECIFY) ☐ FOLLOW UP
COMMENTS: HEPA System #1
These are the minimum smears to be taken on this weekly survey.
Radiation readings need to be taken on system also. (The validation readings are SAR requirement for the Exhaust HEPA System)

RCT: PRINT/SIGNATURE REVIEWED BY:



SURVEY DATA AND LEGEND

ALL SWIPE, LARGE AREA WIPE (LAW), AND DIRECT SCAN SURVEY LOCATIONS ARE IDENTIFIED ON THE MAP. THOSE LOCATIONS WHERE ACTIVITY IS GREATER THAN OR EQUAL TO THE RADCON MANUAL (RCM) TABLE 2-2 LIMITS* ARE RECORDED BELOW.

INSTRUMENTS		
Type	Serial #	Efficiency
		%
		%
		%
Scaler		% $\beta\gamma$
		% α

SWIPE No.	LAW No.	DIRECT SCAN No.	LOCATION OR ITEM DESCRIPTION	SWIPE/SCAN		LAW (dpm)	
				$\beta\gamma$	α	$\beta\gamma$	α
*		*	RCM Table 2-2 limits used for this survey.	1000 / 5000	20 / 500		

CA Contamination Area
HCA High Contamination Area
RA Radiation Area
HRA High Radiation Area
VHRA Very High Radiation Area
RMA Radioactive Material Area
ARA Airborne Radioactivity Area
RBA Radiological Buffer Area
FCA Fixed Contamination Area
SCA Soil Contamination Area
URM Underground Radioactive Material Area
A Area
SOP Step-Off Pad

-x—x- Radiological Barrier

ALL dose rates are in mrem/hr, unless otherwise noted.

General Area Dose Rate
#@#(cm) Dose Rate at Distance From Source
*# Contact Dose Rate
β / # γ Beta Corrected / Gamma Dose Rates
 α Alpha
 β Beta
 γ Gamma
n Neutron

 = Direct Scan

 = Swipe (Smear)

 = Large Area Wipe (LAW)

 = Air Sample

 = Tritium Swipe

RWMC Form-292 Excavator Pre-Operational Checks

Equipment ID _____ Hour Meter Reading _____ Date _____

NOTE: If excavator's operating hours reach 1500, notify OF.

Instructions:				
1.	Perform excavator walk-around inspection.			
2.	Check "SAT" for satisfactory, "UNSAT" for unsatisfactory, or "N/A" for nonapplicable. Record in the Comments section if a condition is unsatisfactory and contact the Shift Supervisor. SS approval required prior to operation.			
3.	Upon Heavy Equipment Operator (HEO) discretion, some checks will require the HEO to start and run the excavator; skill of the craft is involved.			
4.	If leaks are detected, these shall be promptly cleaned up, record leak rate in comments section and notify OF and SE.			
Step		SAT	UNSAT	N/A
1.	Air cleaner gauge indicates proper airflow.			
2.	Exhaust system is operable and vented outside of the building.			
3.	Fire suppression system is operational. (Green power LED is flashing and no alarm condition exists.)			
4.	Hoses, clamps, hydraulic fittings and parts, or motor parts are not leaking fluid.			
5.	Visible electrical wires are neither damaged nor loose.			
6.	Cooling system fluid is at the normal level.			
7.	Hydraulic fluid level (via sight glass) is at normal level.			
8.	Oil level is normal. CAUTION: Oil on level indicator (dipstick) may be hot.			
9.	CCTV monitor is operable.			
10.	Voice communications are functioning.			
11.	No alarm condition exists within the alarm indicator panel.			
12.	Transmission is in "neutral" with the "LOCKED" button down, and the park brake is engaged. (Applies to CTPS; excavator in 671 – its transmission–is locked out.)			
13.	Visually inspect portions of the anchorage structure at or above floor levels to identify loose connections and visible signs of cracking. (SAR)			
14.	Excavator barricades and signs are in place. (CTPS only)			
15.	Visually inspect (by means of camera, binoculars, or mirrors, or other visual-aid device) the excavator swing-stops shims to identify obvious signs of cracking or deformation. (SAR)			
	NOTE: Item 16 is checked when excavator is running.			
16.	Fuel level is adequate. NOTE: If fuel gauge is indicating fuel cell is less than half full, then fill excavator with diesel fuel as needed.			

Comments:

HEO Signature & Date

Shift Supervisor or Operations Foreman & Date

RWMC FORM-297
OU 7-10 Project
Core Sample Tracking Log

PART A

General Information – Complete form in an indelible black ink pen. Make corrections with a single line strikeout and supply initials and date.

Sample Location: OU 7-10 Project Site

Sample ID Number: _____

Sample Core Name: _____

Sample Date/Time (when COC is initiated): ____/____/____

Chain-of-Custody Number: _____

Core Sample Location

Reach (ft) _____

Angle (θ) _____

Starting depth (ft) _____

Ending depth (ft) _____

Core Length: _____

Was the sample taken through stained soil? ☐ Yes ☐ NoDid the sample reach refusal? ☐ Yes ☐ NoComments (**Please discuss any problems that arose during core sampling and any additional information**)

Verification that the sample ID No. on the sample bottle matches that recorded on the chain-of-custody form.

DR Initials_____
GEMO Initials

Recorded by: _____ Date: ____/____/____

Data Recorder

PART B**Shipping Container Information:**

Torque wrench serial number: _____ Calibration Due Date: ____/____/____

QI Signature: _____ Date: ____/____/____

Date shipped to the Analytical Laboratory Department: _____

Signature: _____ Date: ____/____/____

GEMO

☐ Accurate and complete _____

Signature: Sample Coordinator

RWMC Form-298
OU 7-10 Project
Sample Tracking Log

PART A**General Information** – Complete form in black indelible ink. Make corrections with a single line strikeout, supply initials and date.

Sample Location: OU 7-10 Project Site

Sample ID Number: _____

PGS Number: _____

Sample Date/Time (COC is initiated): ____/____/____

Chain-of-Custody Form Number: _____

Gross Sample Weight (lb): _____ DDTC Can Number: _____ ☐ N/A (note in Comments section)

Drum Barcode No. _____

Waste Retrieval Location

Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____
Scoop/Cart No. _____	Reach (ft) _____	Angle (θ) _____	Depth (ft) _____

Sample Media (Please check appropriate box)☐ Soils and waste solidsFlowable, with moisture, or has mud-like consistency ☐ Yes ☐ No☐ Uncontainerized Free Liquids☐ Nitrates☐ Cyanide pellets☐ Unknowns/special case

Description _____

Flowable, with moisture, or has mud-like consistency ☐ Yes ☐ No☐ Interstitial soils for EPAFlowable, with moisture, or has mud-like consistency ☐ Yes ☐ No☐ Interstitial soils for OU 7-13/14Flowable, with moisture, or has mud-like consistency ☐ Yes ☐ No☐ 743 Sludge grab sample for OU 7-13/14☐ 741 or 742 Sludge grab sample for OU 7-13/14**Fissile Monitor Information:** Attach fissile monitor printout

Comments

Verification that the Sample ID No. and DDTC No. match the information recorded on the chain-of-custody form.

DR Initials_____
GEMO Initials

Recorded by _____

Date: ____/____/____

Data Recorder

PART B**Shipping Container Information:**

Torque wrench serial number: _____ Calibration Due Date: ____/____/____

QI Signature: _____ Date: ____/____/____

Drum weighing scale serial number: _____ Calibration Due Date: ____/____/____

Date shipped to the Analytical Laboratory Department: _____

Signature: _____ Date: ____/____/____

GEMO

☐ Accurate and complete _____
Signature: Sample Coordinator

RWMC Form-300 - Project Drum Information**General Information**

Drum Barcode No.: _____

Drum Size: ☐ 55-gal ☐ 85-gal

PGS No. _____ Drum Port No. _____

Drum Start Date/Time (when drum was hooked to port) ____/____/____

Drum Closure Date/Time (when drum was removed from port) ____/____/____

Waste Information

Scoop/Cart Number	Reach (ft)	Angle (°)	Depth (ft)	FGE
<input type="checkbox"/> Soil/Sludge	(Vol % Estimate and Description)	<input type="checkbox"/> Debris Drum	(Vol % Estimate and Description)	
Drum				
<input type="checkbox"/> Soils	_____	<input type="checkbox"/> Empty Drums	_____	
<input type="checkbox"/> 741 Sludge	_____	<input type="checkbox"/> Graphite	_____	
<input type="checkbox"/> 742 Sludge	_____	<input type="checkbox"/> Metal Assemblies	_____	
<input type="checkbox"/> 743 Sludge	_____	<input type="checkbox"/> Cemented Filter Media	_____	
<input type="checkbox"/> 744 Sludge	_____	<input type="checkbox"/> Paper	_____	
<input type="checkbox"/> 745 Sludge	_____	<input type="checkbox"/> Rags	_____	
		<input type="checkbox"/> Plastics	_____	
		<input type="checkbox"/> Cloth Coveralls	_____	
		<input type="checkbox"/> Poly Bottles	_____	
		<input type="checkbox"/> Other	_____	
Miscellaneous Items	(Quantity Estimate and Description)	Miscellaneous Items	(Quantity Estimate and Description)	
<input type="checkbox"/> Absorbed Free Liquid	_____	<input type="checkbox"/> Batteries	_____	
	_____	<input type="checkbox"/> Mercury	_____	
	_____	<input type="checkbox"/> HEPA Filter Material	_____	
	_____	<input type="checkbox"/> Cyanide Pellets	_____	
		<input type="checkbox"/> Nitrates	_____	
		<input type="checkbox"/> Aerosol Cans (Vented)	_____	
		<input type="checkbox"/> Lead Material	_____	
		<input type="checkbox"/> Beryllium	_____	
		<input type="checkbox"/> Artifacts	_____	
		<input type="checkbox"/> Containerized Unknown	_____	
Scoop/Cart Number	Reach (ft)	Angle (°)	Depth (ft)	FGE
<input type="checkbox"/> Soil/Sludge	(Vol % Estimate and Description)	<input type="checkbox"/> Debris Drum	(Vol % Estimate and Description)	
Drum				
<input type="checkbox"/> Soils	_____	<input type="checkbox"/> Empty Drums	_____	
<input type="checkbox"/> 741 Sludge	_____	<input type="checkbox"/> Graphite	_____	
<input type="checkbox"/> 742 Sludge	_____	<input type="checkbox"/> Metal Assemblies	_____	
<input type="checkbox"/> 743 Sludge	_____	<input type="checkbox"/> Cemented Filter Media	_____	
<input type="checkbox"/> 744 Sludge	_____	<input type="checkbox"/> Paper	_____	
<input type="checkbox"/> 745 Sludge	_____	<input type="checkbox"/> Rags	_____	
		<input type="checkbox"/> Plastics	_____	
		<input type="checkbox"/> Cloth Coveralls	_____	
		<input type="checkbox"/> Poly Bottles	_____	
		<input type="checkbox"/> Other	_____	
Miscellaneous Items	(Quantity Estimate and Description)	Miscellaneous Items	(Quantity Estimate and Description)	
<input type="checkbox"/> Absorbed Free Liquid	_____	<input type="checkbox"/> Batteries	_____	
	_____	<input type="checkbox"/> Mercury	_____	
	_____	<input type="checkbox"/> HEPA Filter Material	_____	
	_____	<input type="checkbox"/> Cyanide Pellets	_____	
		<input type="checkbox"/> Nitrates	_____	
		<input type="checkbox"/> Aerosol Cans (Vented)	_____	
		<input type="checkbox"/> Lead Material	_____	
		<input type="checkbox"/> Beryllium	_____	
		<input type="checkbox"/> Artifacts	_____	
		<input type="checkbox"/> Containerized Unknown	_____	

Scoop/Cart Number	Reach (ft)	Angle (θ)	Depth (ft)	FGE
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input type="checkbox"/> Soil/Sludge Drum (Vol % Estimate and Description) <input type="checkbox"/> Soils _____ <input type="checkbox"/> 741 Sludge _____ <input type="checkbox"/> 742 Sludge _____ <input type="checkbox"/> 743 Sludge _____ <input type="checkbox"/> 744 Sludge _____ <input type="checkbox"/> 745 Sludge _____ </div> <div style="width: 48%;"> <input type="checkbox"/> Debris Drum (Vol % Estimate and Description) <input type="checkbox"/> Empty Drums _____ <input type="checkbox"/> Graphite _____ <input type="checkbox"/> Metal Assemblies _____ <input type="checkbox"/> Cemented Filter Media _____ <input type="checkbox"/> Paper _____ <input type="checkbox"/> Rags _____ <input type="checkbox"/> Plastics _____ <input type="checkbox"/> Cloth Coveralls _____ <input type="checkbox"/> Poly Bottles _____ <input type="checkbox"/> Other _____ </div> </div>				
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> Miscellaneous Items (Quantity Estimate and Description) <input type="checkbox"/> Absorbed Free Liquid _____ </div> <div style="width: 48%;"> Miscellaneous Items (Quantity Estimate and Description) <input type="checkbox"/> Batteries _____ <input type="checkbox"/> Mercury _____ <input type="checkbox"/> HEPA Filter Material _____ <input type="checkbox"/> Cyanide Pellets _____ <input type="checkbox"/> Nitrates _____ <input type="checkbox"/> Aerosol Cans (Vented) _____ <input type="checkbox"/> Lead Material _____ <input type="checkbox"/> Beryllium _____ <input type="checkbox"/> Artifacts _____ <input type="checkbox"/> Containerized Unknown _____ </div> </div>				

Was Fissile Material Monitoring Performed on any of the contents of this drum? ☐ YES ☐ NO

If YES, FMM printout is attached

Total FGE for the Drum: _____

Sample ID number(s) associated with the drum _____

Drum Closure Information

Drum Percent Utilization: _____

Torque Wrench No.: _____

Calibration Due Date ____/____/____

Scale Number: _____

Calibration Due Date

____/____/____

Drum Weight (lb): _____

TID Seal Number: _____

Rad Readings at Contact _____ mR/hr

Rad Reading at 30 cm _____ mR/hr

Comments

Signature _____ Date ____/____/____

Data Recorder

RWMC Form-301

OU 7-10 Project Glovebox Pre-Operational Checks

Date: _____ Time: _____

Instructions:				
1. Perform glovebox walk-around inspection. Complete item 1 first; complete other steps in any order.				
2. Check "SAT" for satisfactory, "UNSAT" for unsatisfactory, or "N/A" for not-applicable. Record in the Comments section if a condition is unsatisfactory and contact the Shift Supervisor.				
Step		SAT	UNSAT	N/A
1.	RCT inspection of PGS and RCS complete.			
2.	RCT drum bag-out enclosure inspection complete.			
3.	All gloves in PGS and RCS are in operational status. (No tears or cuts.)			
4.	Torque putty sealant on glovebox window acorn nuts is not broken. Visually inspect at least 50 nuts per glovebox.			
5.	Glovebox has power and all lights are turned on and illuminating. <div style="text-align: right;">(TFR)</div>			
6.	No obstacles are present to hinder glovebox operation.			
7.	One to two gallons of fire suppressant and absorbent are staged in the glovebox. <div style="text-align: right;">(FHA)</div>			
8.	Glovebox is clean and ready to accept waste.			
9.	Perform functional check of drive cart, only if drive cart is empty. <ul style="list-style-type: none"> Any obstructions to the use of the main cart. Cart moves in the commanded directions. Cart drive stops rotating when light curtain is interrupted (outside). Cart has no visible corrosion, deteriorations or cracks. 			
10.	Perform functional check of the glovebox hoist. <ul style="list-style-type: none"> Any obstructions to the use of the hoist. Check upper limit switch. Hoist moves in the commanded directions. Check trolley limit switches Check hook for deformation, chemical or heat damage, or cracks Check that hook swivels freely Inspect chain for nicks, gouges, distortion, wear, cracks, and corrosion. Inspection tag is current. 			
11.	All required signs and postings are in place.			
12.	Housekeeping in and around the glovebox is complete. <div style="text-align: right;">(HASP)</div>			
13.	Drum handling equipment is available for use, as required.			

14.	FMM is secure and FMM shielding wall U-bolts are in place and secured			
-----	-----------------------------------------------------------------------	--	--	--

Step		SAT	UNSAT	N/A
15.	PGS water mist system water supply tank has a minimum 700 gallons water supply. (FHA)			

Comments: _____

 Glovebox Excavator Method Operator (GEMO) Signature & Date

 Shift Supervisor or Operations Foreman Signature & Date

RWMC Form-315

HEAT STRESS STAY TIMES

Clothing	Respirator	Temperature	Heat Stress Stay Time
Single set (2 pair gloves 2 pair boots)	Full Faced Air Purifying Respirator	50-70°F	90 minutes
		70-80°F	
		80-90°F	60 minutes
		90-100°F	45 minutes
		100-110°F	30 minutes

*While temperatures less than 70°F are not considered to be a heat stress environment (MCP-2704), heat stress conditions can still exist below 70°F and should be monitored on a case-by-case basis. At temperatures less than 70°F, stay times may be extended beyond 90 minutes with OF approval. OF must ensure all affected employees are feeling fine and are not experiencing signs of heat stress. An extension may be granted as many times as is needed, however OF must ensure employees are feeling fine every 15 minutes. If at any time, employees experience signs of heat stress, they must exit the area immediately.

[illegible]

OU 7-10 Diesel Generator S-GEN-1 Data Sheet

Date Performed: _____ Performed By: _____

Section 2. Generator Operation and Testing Outputs

NOTE: Additional copies of this section of the form may be used to record operating data as required.

Time	Measured Parameter	Acceptable Range	Actual	Measured Parameter	Acceptable Range	Actual
	Oil Pressure	40-75 psi		Voltage L1L2	460-500 V	
	Coolant Temp	130-210 °F		Voltage L2L3	460-500 V	
	Alternator Volts	24-28 Vdc		Voltage L3L1	460-500 V	
	Frequency (Hz)	59-61 Hz		Voltage L1N	263-290 V	
	Current L1 (A)	<300 A		Voltage L2N	263-290 V	
	Current L2 (A)	<300 A		Voltage L3N	263-290 V	
	Current L3 (A)	<300 A				
	Oil Pressure	40-75 psi		Voltage L1L2	460-500 V	
	Coolant Temp	130-210 °F		Voltage L2L3	460-500 V	
	Alternator Volts	24-28 Vdc		Voltage L3L1	460-500 V	
	Frequency (Hz)	59-61 Hz		Voltage L1N	263-290 V	
	Current L1 (A)	<300 A		Voltage L2N	263-290 V	
	Current L2 (A)	<300 A		Voltage L3N	263-290 V	
	Current L3 (A)	<300 A				
	Oil Pressure	40-75 psi		Voltage L1L2	460-500 V	
	Coolant Temp	130-210 °F		Voltage L2L3	460-500 V	
	Alternator Volts	24-28 Vdc		Voltage L3L1	460-500 V	
	Frequency (Hz)	59-61 Hz		Voltage L1N	263-290 V	
	Current L1 (A)	<300 A		Voltage L2N	263-290 V	
	Current L2 (A)	<300 A		Voltage L3N	263-290 V	
	Current L3 (A)	<300 A				
	Oil Pressure	40-75 psi		Voltage L1L2	460-500 V	
	Coolant Temp	130-210 °F		Voltage L2L3	460-500 V	
	Alternator Volts	24-28 Vdc		Voltage L3L1	460-500 V	
	Frequency (Hz)	59-61 Hz		Voltage L1N	263-290 V	
	Current L1 (A)	<300 A		Voltage L2N	263-290 V	
	Current L2 (A)	<300 A		Voltage L3N	263-290 V	
	Current L3 (A)	<300 A				
	Oil Pressure	40-75 psi		Voltage L1L2	460-500 V	
	Coolant Temp	130-210 °F		Voltage L2L3	460-500 V	
	Alternator Volts	24-28 Vdc		Voltage L3L1	460-500 V	
	Frequency (Hz)	59-61 Hz		Voltage L1N	263-290 V	
	Current L1 (A)	<300 A		Voltage L2N	263-290 V	
	Current L2 (A)	<300 A		Voltage L3N	263-290 V	
	Current L3 (A)	<300 A				

**RWMC Form-371
RADIOLOGICAL CONTROL
TOTAL CONTAINMENT (TC) CERTIFICATION OF THE RETRIEVAL CONFINEMENT
STRUCTURE
FOR OU 7-10 GLOVEBOX EXCAVATOR METHOD
(MINIMUM REQUIREMENTS)**

Location: RWMC WMF-671 Room or Area: Weather Enclosure Structure
System or Component: Retrieval Confinement Structure
RCT Performing Inspection: _____
Date: _____ Time: _____
Certified RCS: Yes ☐ No ☐

Record RadCon surveys on RWMC Form-371. The RadCon survey form may have additional smears added as needed due to extra gloves or as determined by the RCTs to investigate areas when warranted.

Items 1 through 9 implement RWMC SAR-4, Addendum J, authorization basis commitments. The Shift Supervisor must resolve any deficiencies found prior to certification of confinement.

If any of these items is NO, notify the RadCon Lead and OU 7-10 Operations Foreman.

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Verify all in-use gloves are inspected for integrity and proper installation. Verify the gloves' visible external layer surfaces are not torn, cracked, or cut, and do not have holes and/or show signs of excessive wear (such as, reduction of glove thickness). (SAR)*	_____	_____	_____
2. Verify visible internal layers of all in-use gloves are inspected for excessive cracks or peeling. Excessive cracks or peeling is defined as cracks approximately 1/8 in. by 2-in. long without stretching the glove, or peeling in areas larger than approximately the size of a half-dollar coin.	_____	_____	_____
2. Verify that external surfaces of all gloves are free of radiological contamination (less than RCM Table 2-2 removable limits) by taking one smear on each glove. (SAR)*	_____	_____	_____
3. Verify the visible and readily accessible portions of the Excavator-to-RCS interface gasket are free of obvious damage (for example, cuts, cracks, and excessive wear). (SAR)*	_____	_____	_____
4. Verify that the gasket provides an adequate seal by doing a radiological contamination survey of the readily accessible exterior Excavator-to-RCS interface gasket. Verify that the readily accessible portions of the gasket are free of radiological contamination (less than RCM Table 2-2 removable limits). (SAR)*	_____	_____	_____
5. Verify the visible, readily accessible, exterior portions of the RCS-to-PGS interface gasket are not torn, cracked, or cut, and do not have holes and/or show signs of excessive wear. (SAR)*	_____	_____	_____
6. Verify the visible and readily accessible portions of the RCS-to-PGS interface are free of radiological contamination (less than RCM Table 2-2 removable limits). (SAR)*	_____	_____	_____
7. Verify Bag-in/Bag-out port is inspected for integrity and proper installation of transfer sleeve. Verify transfer sleeve is secured out of the way and is not in a position where it could be punctured or torn. (SAR)*	_____	_____	_____
8. Verify transfer port is free of radiological contamination (less than RCM Table 2-2 removable limits). (SAR)*	_____	_____	_____
9. Verify the three primary RCS doors are closed and adequately taped (when not in use) and a radiological contamination survey (less than the RCM Table 2-2 removable limits) is performed on the RCS door seals of the three primary confinement RCS doors. (SAR)*	_____	_____	_____
10. Verify the accessible area of the RCS-to-exhaust-HEPA filter interface gasket is free of radiological contamination (less than RCM Table 2-2 removable limits).	_____	_____	_____

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
11. Verify that a step-off pad has been placed at the RCS personnel door exit (as needed) and that it is in a satisfactory condition.			
12. Verify that protective clothing doffing procedure (as needed) is posted at the RCS personnel door exit.			
13. Verify radiological posting (as needed) is adequate for three RCS entry points.			

Line Management and Radiological Management approval required to identify any of these inspection criteria as N/A.

*Steps 1-9 cannot be marked as N/A.

Comments: _____

Identify any restrictions on certification of RCS. _____

Shift Supervisor has reviewed and is aware of all deficiencies including SAR issues and has notified appropriate personnel to get the deficiencies corrected.		
Shift Supervisors Signature:	Date:	

Organizations/Personnel Notified: _____

BARCODE # _____

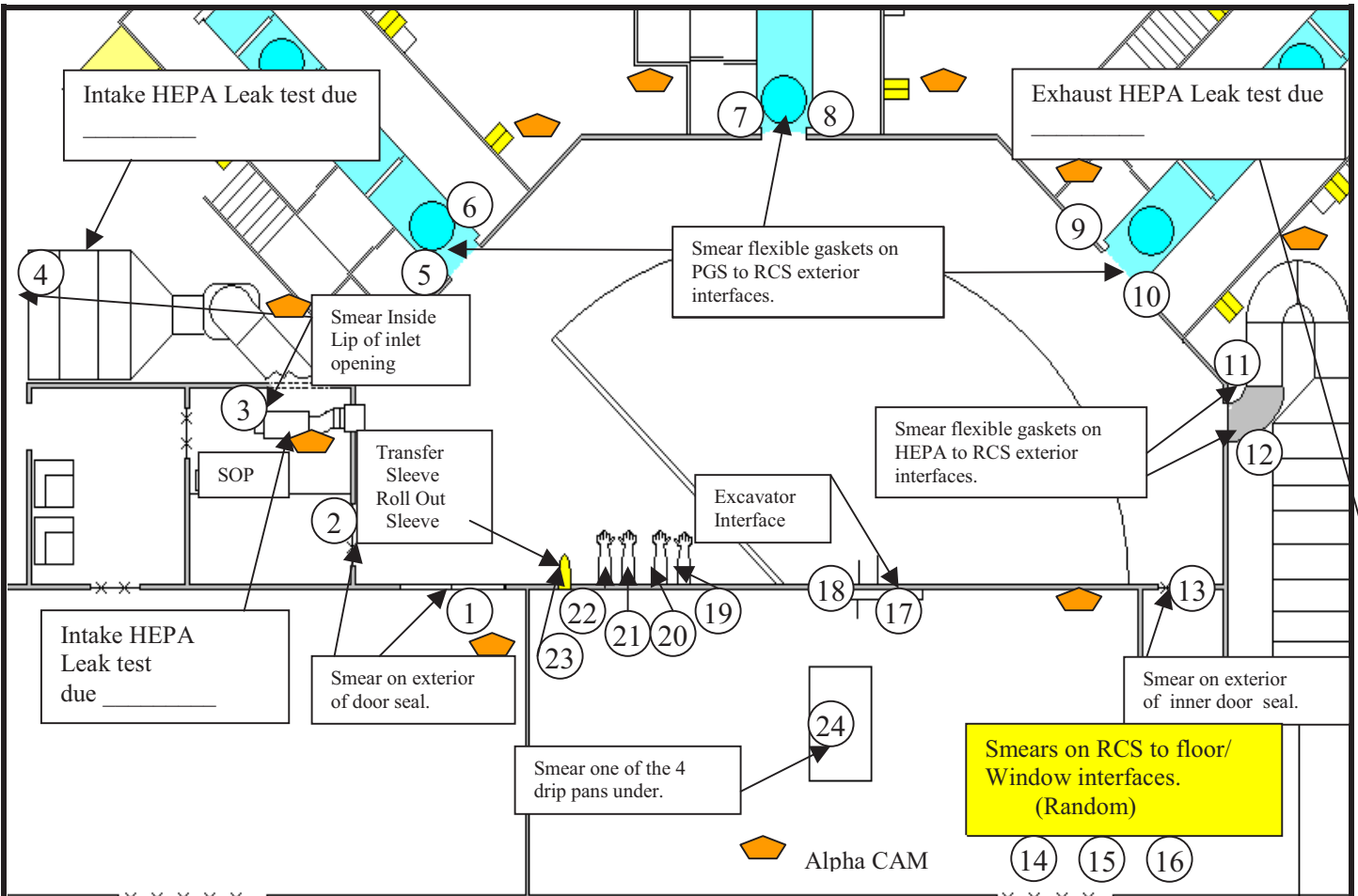
BLDG.: WMF-671
 AREA/ROOM: RCS
 RWP #: _____
 LOG #: _____
 DATE: _____
 TIME: _____

☒ ROUTINE
☐ NON-ROUTINE (SPECIFY) _____
☐ FOLLOW UP _____
JOB DESCRIPTION
 COMMENTS: Daily RCS survey for containment checks with marked
survey points to be in compliance with the SAR. These are the minimum
smears to be taken.
 ALARA Task # _____

RCT: _____

REVIEWED BY: _____

PRINT/SIGNATURE



Comments / Issues: _____

ALL SWIPE, LARGE AREA WIPE (LAW), AND DIRECT SCAN SURVEY LOCATIONS ARE IDENTIFIED ON THE MAP. THOSE LOCATIONS WHERE ACTIVITY IS GREATER THAN OR EQUAL TO THE RADCON MANUAL (RCM) TABLE 2-2 LIMITS* ARE RECORDED BELOW.

[illegible]

- = Direct Scan
- = Swipe (Smear)
- └ = Large Area Wipe (LAW)
- △ = Air Sample
- ⬆ = Tritium Swipe

RWMC Form-372
RADIOLOGICAL CONTROL TOTAL CONTAINMENT (TC)
CERTIFICATION OF THE PACKAGING GLOVEBOX SYSTEM AND DRUM LOADOUT ENCLOSURE
FOR OU 7-10 GLOVEBOX EXCAVATOR METHOD (MINIMUM REQUIREMENTS)

Location: RWMC WMF-671 Room or Area: Weather Enclosure Structure

System or Component: Packaging Glovebox System and Drum Loadout Enclosure Number: _____

RCT Performing Inspection: _____

Date: _____ Time: _____

Certified PGS: Yes ☐ No ☐

Certified DLE: Yes ☐ No ☐

Record RadCon Surveys on RWMC Form-372, Radiological Survey Report, and attach a copy. The RadCon survey form may have additional smears added as needed due to extra gloves or as determined by RCTs to investigate areas when warranted.

Items 1 through 7 implement RWMC SAR-4, Addendum J, authorization basis commitments. The Shift Supervisor must resolve any deficiencies found prior to certification of confinement.

If any of these items is NO, notify the RadCon Lead and OU 7-10 Operations Foreman.

PACKAGING GLOVEBOX SYSTEM		<u>YES</u>	<u>NO</u>	<u>N/A</u>
1.	Verify all in-use gloves are inspected for integrity and proper installation. The gloves visible external layer surfaces are not torn, cracked, or cut, and do not have holes and/or show signs of excessive wear (such as, reduction in glove thickness). (SAR)*	_____	_____	
2.	Verify visible internal layers of all in-use gloves are inspected for excessive cracks or peeling. Excessive cracks or peeling is defined as cracks approximately 1/8 in. by 2-in. long without stretching the glove, or peeling in areas larger than approximately the size of a half-dollar coin.	_____	_____	
3.	Verify that external surfaces of all gloves are free of radiological contamination (less than RCM Table 2-2 removable limits) by taking one smear on each glove. (SAR)*	_____	_____	
4.	Verify gasket between the PGS and RCS is inspected for integrity. Verify visible and readily accessible external surfaces are not torn, cracked, or cut, and do not have holes and/or show signs of excessive wear. (SAR)*	_____	_____	
5.	Verify the readily accessible portions of the exterior gasket between the PGS and RCS are free of radiological contamination (less than the RCM Table 2-2 removable limits). (SAR)*	_____	_____	
6.	Inspect Bag-in/Bag-out port for integrity and proper installation of transfer sleeve. Transfer sleeve is secured out of the way and is not in a position where it could be punctured or torn. Installed sleeves' visible external and internal surfaces are not torn, cracked, or cut, and/or do not have holes. (SAR)*	_____	_____	
7.	Verify Bag-in/Bag-out port is free of radiological contamination (less than RCM Table 2-2 removable limits). (SAR)*	_____	_____	

PACKAGING GLOVEBOX SYSTEM		<u>YES</u>	<u>NO</u>	<u>N/A</u>
8.	Verify the exterior surfaces of the Double Door Transfer Container (DDTC) are free of radiological contamination (less than RCM Table 2-2 removable limits). Verify port door if DDTC container is not installed. (SAR)*	_____	_____	_____
9.	Verify the exterior surfaces of the Double Door Transfer Container (DDTC) are inspected for integrity and proper installation. Verify port door if DDTC container is not installed.	_____	_____	_____
10.	Verify radiological posting (as needed) is adequate for work in the Packaging Glovebox System.	_____	_____	_____
11.	Verify proper air flow (air flow is into the total containment) and that installed HEPA filter units have current leak test.	_____	_____	_____
12.	Verify no obvious cracking is present on the internal and/or external PGS floor. Verify no new obvious cracking is present on the internal and/or external PGS windows or ceiling. Verify all previously identified cracks have not extended past the end marks applied when initially identified. On previously identified exterior panel cracks verify that interior glass panel has not cracked. Verify there is no detectable contamination on the external surfaces of previously identified cracks. Appropriate personnel will evaluate any new cracks or extension of existing cracks. If this evaluation determines that the integrity of the containment is maintained, then this evaluation will be documented in the Comments section and the step will be marked YES.	_____	_____	_____
13.	Verify housekeeping is satisfactory by having all tools properly stored, the waste removed, and other materials taken care of properly.	_____	_____	_____
14.	Verify the inlet HEPA filter duct opening is free of radiological contamination (less than the RCM Table 2-2 removable limits).	_____	_____	_____
15.	Verify three randomly selected areas on PGS window gasket interfaces are free of radiological contamination (less than RCM Table 2-2 removable limits).	_____	_____	_____
16.	Verify the exterior surfaces of two blank gloveport covers (randomly selected) are free of radiological contamination (less than the RCM Table 2-2 removable limits).	_____	_____	_____
17.	Verify approved /disapproved tag or sticker is attached and updated as necessary.	_____	_____	_____

Line Management and Radiological Management approval required to identify any of these inspection criteria as N/A.

*Steps 1-7 cannot be marked as N/A.

DRUM LOADOUT ENCLOSURE				
1.	Verify visible hand tools, drum lifts, and other components that have inaccessible areas are wrapped, as appropriate, to minimize decontamination.	_____	_____	_____
2.	Verify outer door zippers and Velcro seals are not damaged, function properly and that they are free of radiological contamination (less than the RCM Table 2-2 limits).	_____	_____	_____
3.	Verify integrity of windows, doors, penetrations and fixtures.	_____	_____	_____
4.	Verify proper air flow (air flow is into the DLE).	_____	_____	_____
5.	Verify the integrity of the HEPA-filtered ventilation system's connections to the DLE.	_____	_____	_____

DRUM LOADOUT ENCLOSURE

- | | | | | |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|
| 6. | Verify DLE is free of tears, loose seams, cuts, or any other loss of integrity. | _____ | _____ | _____ |
| 7. | Verify DLE is adequately supported with no significant tears or cuts in support loops. | _____ | _____ | _____ |
| 8. | Verify transfer port seals properly with no degradation of Velcro closure. | _____ | _____ | _____ |
| 9. | Verify sharp edges are blunted or taped over. Power tools are unplugged when not in use. | _____ | _____ | _____ |
| 10. | Verify support devices for components that may be disconnected are adequately supported so that they will not fall if disconnected (if used). | _____ | _____ | _____ |
| 11. | Verify exhaust HEPA filter leak test is current. | _____ | _____ | _____ |
| 12. | Verify that a step-off pad has been placed at the DLE entry and is in satisfactory condition. | _____ | _____ | _____ |
| 13. | Verify radiological posting (as needed) for DLE entry is posted at the entrance (revise as necessary) and that protective clothing doffing procedure is posted at the exit. | _____ | _____ | _____ |
| 14. | Verify installation and operation of an ALPHA 7 in-line continuous air monitor (if required). | _____ | _____ | _____ |
| 15. | Verify housekeeping is satisfactory by having all tools properly stored, the waste removed, and other materials taken care of properly. The service lines must not interfere with work or pose a tripping hazard and all unnecessary materials are removed from DLE. | _____ | _____ | _____ |
| 16. | Verify ring stands or waste receptacle containers are staged at the personnel exit point. | _____ | _____ | _____ |
| 17. | Verify radiological contamination levels in the DLE are acceptable (as posted for a Contamination Area from most recent survey) for entry. | _____ | _____ | _____ |
| 18. | Verify utility ports and the DLE ventilation backflow devices are in place as required. | _____ | _____ | _____ |
| 19. | Verify approved/disapproved tag or sticker is attached and updated as necessary. | _____ | _____ | _____ |

Line Management and Radiological Management approval required to identify any of these inspection criteria as N/A.

Comments: _____

Identify any restrictions on certification of PGS and DLE: _____

List all previously identified cracks in the PGS windows and/or ceiling. _____

Shift Supervisor has reviewed and is aware of all deficiencies and has notified appropriate personnel to get the deficiencies corrected.		
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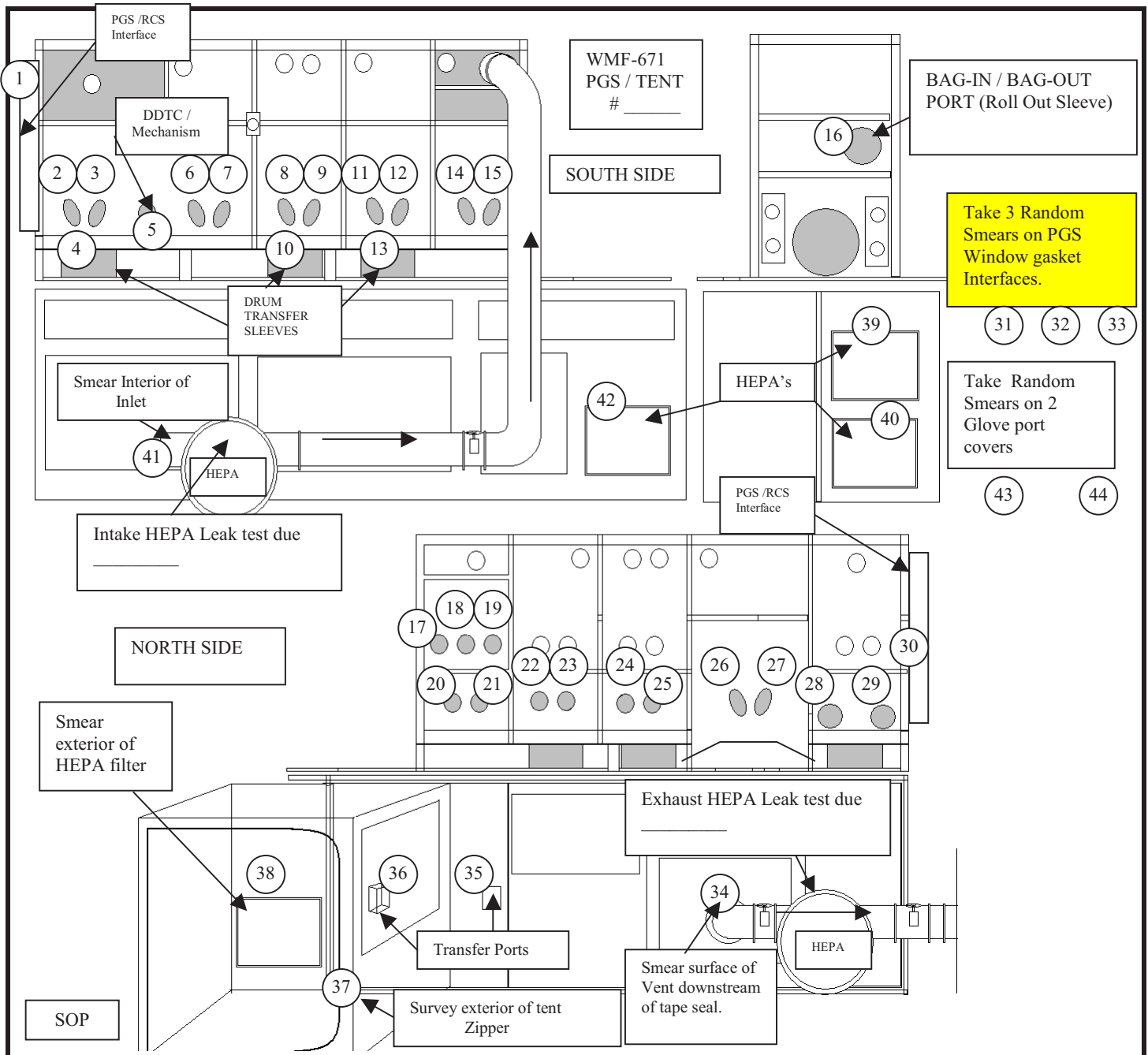
Shift Supervisors Signature:	Date:	
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Organizations/Personnel Notified: _____

BLDG.: <u>WMF-671</u>	<input checked="" type="checkbox"/> ROUTINE	JOB DESCRIPTION
AREA/ROOM: <u>PGS / DLE #</u>	<input type="checkbox"/> NON ROUTINE (SPECIFY) <input type="checkbox"/> FOLLOW UP	
RWP #: _____	COMMENTS: <u>Daily PGS / DLE survey for containment checks with</u>	
LOG #: _____	<u>marked survey points. These are the minimum smears to be taken.</u>	
DATE: _____	<u>DLE Posted as a CA & ARA</u>	
TIME: _____	<u>ALARA Task:</u>	

RCT: _____ REVIEWED BY: _____

PRINT/SIGNATURE



SURVEY DATA AND LEGEND

ALL SWIPE, LARGE AREA WIPE (LAW), AND DIRECT SCAN SURVEY LOCATIONS ARE IDENTIFIED ON THE MAP. THOSE LOCATIONS WHERE ACTIVITY IS GREATER THAN OR EQUAL TO THE RADCON MANUAL (RCM) TABLE 2-2 LIMITS* ARE RECORDED BELOW.

INSTRUMENTS

Type	Serial #	Efficiency
		%
		%
		%
Scaler		% $\beta\gamma$
		% α

[illegible]

CA	Contamination Area
HCA	High Contamination Area
RA	Radiation Area
HRA	High Radiation Area
VHRA	Very High Radiation Area
RMA	Radioactive Material Area
ARA	Airborne Radioactivity Area
RBA	Radiological Buffer Area
FCA	Fixed Contamination Area
SCA	Soil Contamination Area
URMA	Underground Radioactive Material Area
SOP	Step-Off Pad

-x—x- Radiological Barrier

ALL dose rates are in mrem/hr, unless otherwise noted.

#	General Area Dose Rate
@#(cm)	Dose Rate at Distance From Source
*#	Contact Dose Rate
#β / #γ	Beta Corrected / Gamma Dose Rates
α	Alpha
β	Beta
γ	Gamma
n	Neutron

☐ = Direct Scan

 = Swipe (Smear)

L = Large Area Wipe (LAW)

Δ = Air Sample

 = Tritium Swipe

RWMC Form-373
RADIOLOGICAL CONTROL
TOTAL CONTAINMENT (TC) CERTIFICATION OF THE RADCON SMEAR COUNTING
GLOVEBOX
FOR OU 7-10 GLOVEBOX EXCAVATOR METHOD
(MINIMUM REQUIREMENTS)

Location: RWMC WMF-671 Room or Area: Weather Enclosure Structure

System or Component: Radcon Smear Counting Glovebox

RCT Performing Inspection: _____

Date: _____ Time: _____

Certified RCT Glovebox: Yes ☐ No ☐

Deficiencies Reported to:

Record RadCon Surveys on RWMC Form-373. The RadCon survey form may have additional smears added as needed due to extra gloves or as determined by RCTs to investigate areas when warranted.

If any of these items is NO, notify the RadCon Lead and OU 7-10 Operations Foreman.

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Verify exterior surfaces of the total containment is free of tears, loose joints or seams, any other loss of integrity and these areas are free of radiological contamination (less than the RCM Table 2-2 removable limits). Carefully examine windows, joints, seams, penetrations, and fixtures.	_____	_____	_____
2. Verify area is free of hazards to personnel safety.	_____	_____	_____
3. Verify protective clothing requirements for glovebox use are posted on or near the glovebox.	_____	_____	_____
4. Verify that proper air flow (air flow is into the total containment) has been verified. Verify that the differential pressure gauge reads greater than 0.5 iwq.	_____	_____	_____
5. Verify integrity of the HEPA-filtered ventilation system, including the hose connections to the containment and to the vacuum housing. Verify leak check is current.	_____	_____	_____
6. Verify utility ports are in place as required.	_____	_____	_____
7. Verify the total containment is adequately supported.	_____	_____	_____
8. Verify housekeeping is satisfactory by having all tools properly stored, the waste removed, and other materials taken care of properly. Service lines must not interfere with work or pose a tripping hazard and all unnecessary materials must be removed from total containment.	_____	_____	_____
9. Verify radiation and contamination levels in the RCT glovebox are acceptable (as posted for a Radiation Area, Contamination Area) for use.	_____	_____	_____
10. Verify visual inspection of the external layer surfaces of each in-use glove is performed. The glove's visible external surfaces are not torn, cracked, or cut, and do not have holes and/or show signs of excessive wear (such as, reduction in glove thickness).	_____	_____	_____
11. Verify visible internal layers of all in-use gloves are inspected for excessive cracks or peeling. Excessive cracks or peeling is defined as cracks approximately 1/8 in. by 2-in. long without stretching the glove or peeling in areas larger than approximately the size of a half-dollar coin.	_____	_____	_____
11. Verify the external surfaces of the gloves are free of radiological contamination (less than the RCM Table 2-2 removable limits).	_____	_____	_____
12. Verify a visual inspection and that the external surfaces of the of bag-in/bag-out port is free of radiological contamination (less than the RCM Table 2-2 removable limits).	_____	_____	_____
13. Verify a visual inspection and that the external surfaces of the Double Door Transfer Container (DDTC) Assembly is free of radiological contamination (less than the RCM Table 2-2 removable limits) is performed.	_____	_____	_____
14. Verify approved/disapproved tag or sticker is attached and updated as necessary.	_____	_____	_____

Line Management and Radiological Management approval required to identify any of these inspection criteria as N/A.

Comments: _____

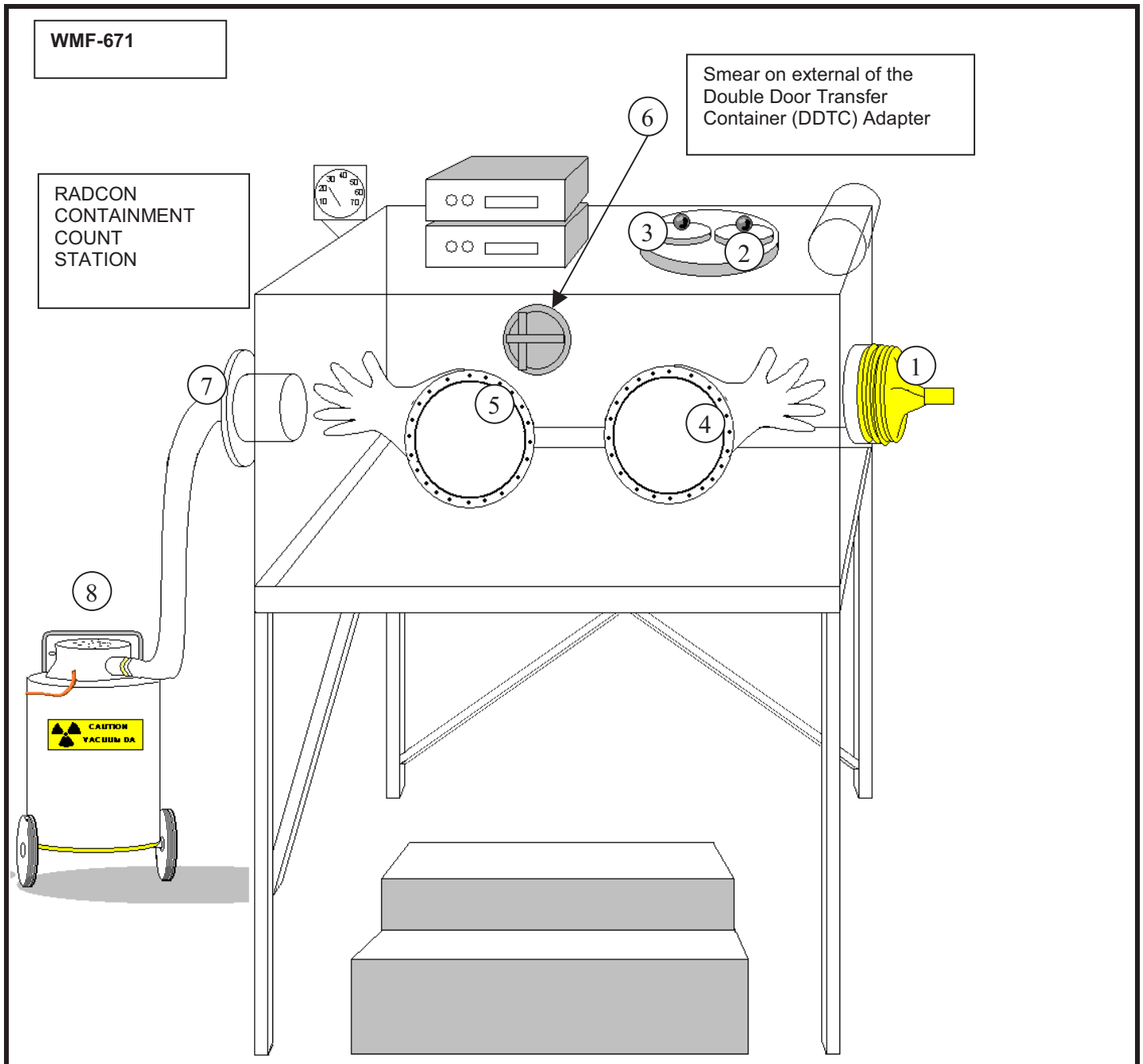
Identify any restrictions on certification of RCT Glovebox.

BARCODE #

BLDG.: WMF-671
 AREA/ROOM: RADCON Station
 RWP #:
 LOG #:
 DATE:
 TIME:

☒ ROUTINE **JOB DESCRIPTION**
☐ NON ROUTINE (SPECIFY) ☐ FOLLOW UP
 COMMENTS: Daily Radcon Smear Counting Glove Box survey for
 containment checks with marked survey points.
 These are the minimum smears to be taken.
 ALARA Task #

RCT: PRINT/SIGNATURE REVIEWED BY:



SURVEY DATA AND LEGEND

ALL SWIPE, LARGE AREA WIPE (LAW), AND DIRECT SCAN SURVEY LOCATIONS ARE IDENTIFIED ON THE MAP. THOSE LOCATIONS WHERE ACTIVITY IS GREATER THAN OR EQUAL TO THE RADCON MANUAL (RCM) TABLE 2-2 LIMITS* ARE RECORDED BELOW.

INSTRUMENTS		
Type	Serial #	Efficiency
		%
		%
		%
Scaler		% $\beta\gamma$
		% α

[illegible]

CA	Contamination Area
HCA	High Contamination Area
RA	Radiation Area
HRA	High Radiation Area
VHRA	Very High Radiation Area
RMA	Radioactive Material Area
ARA	Airborne Radioactivity Area
RBA	Radiological Buffer Area
FCA	Fixed Contamination Area
SCA	Soil Contamination Area
URMA	Underground Radioactive Material Area
SOP	Step-Off Pad

-x—x- Radiological Barrier

ALL dose rates are in mrem/hr, unless otherwise noted.

#	General Area Dose Rate
#@#(cm)	Dose Rate at Distance From Source
*#	Contact Dose Rate
#β / #γ	Beta Corrected / Gamma Dose Rates
α	Alpha
β	Beta
γ	Gamma
n	Neutron

- = Direct Scan
- = Swipe (Smear)
- L = Large Area Wipe (LAW)
- △ = Air Sample
- ⬜ = Tritium Swipe



Appendix E

Summary of the Project Inspection and Maintenance Matrix

Appendix E

Summary of the Project Inspection and Maintenance Matrix

A comprehensive program of maintenance, monitoring, and inspection activities were performed throughout the project operations period. All major facility systems included both inspection and maintenance activities, which were performed in accordance with company standards and procedures. Table E-1 provides a summary of the OU 7-10 Glovebox Method Project inspection and maintenance matrix. Table E-1 identifies inspections and maintenance performed on project facilities and equipment and does not include inspections associated with waste storage areas.

Table E-1. A summary of the OU 7-10 Glovebox Method Project inspection and maintenance matrix.

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Breathing Air and Plant Air			
1. Breathing Air System			
Breathing air receiving tank pressure gauge			
Personnel monitoring room manifold breathing air Pressure gauges	—	—	BA-MAF-1, BA-MAF-2. Semiannual: manifold box inspection, air pressure
Breathing air manifold and filters	—	—	BA-MAF-1, BA-MAF-2. Semiannual: manifold box inspection, air quality, air flow; BA-MAF-1, BA-MAF-2. Annual: Replace filter and vapor cartridges
Receiver tank and piping	—	—	—
Breathing air trailer and compressor	—	—	—
Air valves	—	—	—
2. Plant Air System			
Pressure gauge following compressor			
Pressure gauges following receiver tank	Form-327. (Visual parameter check) plant air: “Air Pressure (PA-PI-3)”		—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Plant air compressor	Form-327. (Visual parameter check) plant air: “Compressor line pressure on instrument gauge panel, compressor discharge temperature on instrument gauge panel”	—	PA-CMP-2 (WMF-671 Plant Air Compressor). Monthly: Filter maintenance and Clean return line; PA-CMP-2 (WMF-671 Plant Air Compressor). Semiannual: Clean or replace air filters and filter housing; PA-CMP-2 (WMF-671 Plant Air Compressor). Annual: replace gaskets and separator element.
Receiver Tank And Piping			
Air filter	Form-327. Dust suppression system: “air filter PA-FLT-1 orange indicator”; Form-327. General housekeeping. “Plant air checked for water/condensate and liquid drained, if present per TPR-1801”	—	—
Air valves	—	—	—
Electrical			
3. Normal Power System			
Breaker panels/breakers from load center to project	—	—	—
Breaker panels/breakers to load center	—	—	—
Cable trays	—	—	—
Conduit from load center and automatic transfer switch to project	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Contactors	—	—	—
Control panels	—	—	—
Electrical power cabling and wiring from load center and automatic transfer switch to project	—	—	—
Electrical power cabling and wiring to load center and automatic transfer switch	—	—	—
Electrical receptacles	—	—	—
Electrical switches (lighting and disconnects)	—	—	—
Ground fault circuits interrupters located at the Packaging Glovebox System (PGS) PGS, RCS, and Weather Enclosure Structure (WES) exterior	—	—	N-N-0671 GFCI Receptacles and Breakers. Monthly: "Test per NFPA 70E"
Lighting panels	—	—	—
Power panels	—	—	—
Safety disconnect switches	—	—	—
Transformers from load center to project	—	—	—
Transformers to load center	—	—	—
4. Standby Power System			
Automatic transfer switch	—	—	—
Contactor	—	—	—

Table E-1. (continued).

Material and Equipment Required (during retrieval operations)	Inspections		Maintenance
	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Control panel	—	—	—
Diesel generator	Form-327. Diesel generator, S-GEN-1: “Diesel Generator RUN/STOP/AUTO switch position”; Form-331. Section 1, Setup and Weekly Surveillance Data: “Hour meter, fuel tank level, engine oil level, engine coolant level, engine coolant heater, fan and alternator belts condition, radiator air inlets and outlets, hoses, coolant, oil or fuel leaks, general cleanliness of generator trailer, batteries, BAT charger voltmeter, BAT charge ammeter”; Form-331. Section 2, Generator Operation and Testing Outputs: “Oil Pressure, Coolant Temp, Alternator Volts, Frequency, (Hz), Current L1 (A), Current L2 (A), Current L3 (A)”	—	S-GEN-1 Backup power generator for WMF-671. Monthly: “Check coolant, oil level, radiator, drain pre-filter, check oil press”; S-GEN-1 Backup power generator for WMF-671. Semiannual: “Check antifreeze mix, coolant conditioner, drive belt, air filter element”; S-GEN-1 Backup power generator for WMF-671. Annual: “Change oil, oil filter, fuel filter, fuel strainer, inspect electrical”
Generator fuel tank	Form-327. Diesel generator, S-GEN-1: “Diesel Generator Fuel Check”	—	—
Lighting panel	—	—	—
Power panel	—	—	—
RPM meter for the generator	—	—	—
Safety disconnect switch	—	—	—
Transformer	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Excavator			
5. Depth Monitor	—	—	—
6. Drum Sizing Tray	—	—	—
7. End Effectors and Accessories (hydraulic hammer, 16-in. wide bucket, 24-in. wide jaw bucket, 24-in. wide bucket, drum puncture tool, diamond spade)	—	—	—
8. End-Effector Stands (hydraulic hammer stand, jaw bucket stand, drum puncture tool stand, diamond spade stand)	—	—	—
9. Excavator Body, Including:	Form-292. Step 3: “Check that fire suppression system is operational.” Form-292. Step 5: “Visible electrical wires are neither damaged nor loose”; Form-292. Step 6: “Cooling system fluid is at the normal level”; Form-292. Step 7: “Hydraulic fluid level (via sight glass) is at normal level”; Form-292. Step 8: “Oil level is normal”; Form-292. Step 12: “Transmission is in “neutral” with the “LOCKED” button down, and the park brake is engaged”; Form-292. Step 16: “Fuel gauge is indicating half full or more”	—	Caterpillar 446B Excavator. Bi-Weekly: “Battery checks, Oil filter inspection, Oil level check/change, Backhoe auto-lube system fill and grease non-auto-lube points, cooling system level check/add, engine air filter inspect/clean/replace, Hydraulic oil level check/add/change, Cab filter clean/replace, AC belt, Alternator belt, Fan belt, Water pump belt”
Air cleaner	Form-292. Step 1: “Check air cleaner gauge for proper airflow”	—	See “Excavator Body, Including” Section
Auto lube system	—	—	See “Excavator Body, Including” Section

Table E-1. (continued).

Material and Equipment Required (during retrieval operations)	Inspections		Maintenance
	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Bulkhead fittings	Form-292. Step 4: “Hoses, clamps, hydraulic fittings and parts, or motor parts are not leaking fluid”	—	—
Fuel filter drain	—	—	See “Excavator Body, Including” Section
Fuel tank drain	—	—	—
Hydraulic coupler	—	—	—
Hydraulic pump drive shaft spline	—	—	—
Inner and outer boot seal	—	Form-371. Step 3: Verify the visible and readily accessible portions of the excavator-to RCS interface gasket are free of obvious damage. Form-371. Step 4: Verify that the gasket provides an adequate seal by doing a radiological survey of the readily accessible portions of the excavator-to RCS interface gasket.	—
Swing stop shims	Form-292. Step 15: “Visually inspect ..the excavator swing-stops shims to identify obvious signs of cracking or deformation”	—	—
PRM, volt, hour, fuel gauges, pressure, temperature	Form-292. Step 1: “Air cleaner gauge indicates proper airflow”; Form-292. Step 11: “No alarm condition exists within the alarm indicator panel”	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
10. Excavator Drip Pans (excavator catch basins)	—	—	—
11. Excavator Exhaust System (exhaust ducting and exhaust fan)	Form-292. Step 2: “Exhaust system is operable and vented outside of the building”	—	—
12. Excavator Anchorage System	Form-292. Step 13: “Visually inspect portions of the anchorage structure”	—	—
13. Drum Weighing System (including Heise pressure gauge and Ocala depth monitor)	—	—	—
Heating and Ventilating (H&V) System			
14. Control Panel (PLC/HMI)	—	—	—
15. Drum Load-Out Enclosure Exhaust High-Efficiency Particulate Air (HEPA) Pressure Gauges	Form-327. PGS #1: “HV-PDI-12”; Form-327. PGS #2: “HV-PDI-22”; Form-327. PGS #3: “HV-PDI-32”;	—	—
16. Drum Load-Out Enclosure Exhaust HEPA Filter Housing (RCS Inlet HEPA)	—	Form-371. Step 21: Verify each of the inlet HEPA filter duct openings is free of radiological contamination.; Form-372. Step 11: “Verify exhaust HEPA filter leak test is current”	—
17. Electric Resistance Heaters for WES (forced air)	—	—	—
18. Electric Resistance Heaters for WES (radiant)	—	—	—

Table E-1. (continued).

Material and Equipment Required (during retrieval operations)	Inspections		Maintenance
	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
19. RCS and PGS Inlet H&V Ductwork and Dampers			
Downstream from HEPA filters	—	FRM-158. Verify ducting and dampers between the RCS and the RCS inlet HEPA filter bank is free of radiological contamination (swipes), FRM-158. Verify ducting and damper between the RCS and the Personnel Access Room HEPA filter housing is free of radiological contamination (swipes), FRM-159. Verify ducting and damper between the RCS and the Drum Loadout Enclosure HEPA filter housings are free of radiological contamination (swipes), FRM-159. Verify ducting and damper between the PGS and the PGS inlet HEPA filter housings are free of radiological contamination (swipes)	—
Upstream from HEPA filters	—	—	—
20. RCS Outlet H&V Ductwork and Dampers			
Downstream from HEPA filters	—	—	—
Upstream from HEPA filters	—	FRM-158. Verify ducting and dampers between the RCS and the RCS outlet HEPA filter bank are free of radiological contamination (swipes)	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
21. HEPA Filters (installed)	—	Form-371. Step 14: Verify proper air flow and that installed HEPA filter units have current leak test.	HV-FLT-1 to -7,-11, -12, -21, -22, -31, -32, -40 to -48 (HEPA filters in WES). Annual: “Insure filters are tested after installation, modification, and repair” “Perform in-place HEPA filter test per TPR-5054”
22. Motor Starter for Exhaust Fans	—	—	—
23. Personnel Access Room HEPA Pressure Gauge	Form-327. personnel access HEPA filter: “HV-PDI-3”,	—	—
24. Personnel Access Room HEPA Filter Housings (RCS inlet HEPA)	—	Form-371. Step 21: Verify each of the inlet HEPA filter duct openings is free of radiological contamination.	—
25. PGS (magnehelic) Differential Pressure Gauges	Form-327. PGS #1: “HV-PDI-13”; Form-327. PGS #2: “HV-PDI-23”; Form-327. PGS #3: “HV-PDI-33”;	—	—
26. PGS Inlet HEPA Filter Housings (RCS inlet HEPA)	—	Form-371. Step 21: Verify each of the inlet HEPA filter duct openings is free of radiological contamination.; Form-372. Step 13: “Verify the inlet HEPA filter duct opening is free of radiological contamination”.	—
27. PGS Inlet HEPA Pressure Gauges	Form-327. PGS #1: “HV-PDI-11”; Form-327. PGS #2: “HV-PDI-21”; Form-327. PGS #3: “HV-PDI-31”	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
28. Primary and Backup Exhaust Fans	—	—	HV-HV-0671 H&V fans. weekly: “grease bearings, inspect vibration and noise.”
29. RCS By-Pass Damper and Damper Switch (RCS pressure relief system)	Form-327. main exhaust: “Exhaust damper power (HV-HS-52) amber light, exhaust damper (HV-DMP-52)”	—	—
Uninterruptible power supply (UPS)	Form-327. exhaust damper UPS: “Exhaust Damper UPS On line (HV-UPS-7101)”	—	—
30. RCS Demister Heaters	Form-327. RCS exhaust HEPA filters: “Moisture separators are drained per TPR-1806”	—	—
31. RCS Exhaust HEPA Filter Housing	—	Form-371. Step 10: Verify the accessible area of the RCS-to- exhaust-HEPA filter interface gasket is free of radiological contamination.	—
32. RCS Exhaust HEPA Pressure Gauges	Form-327. mist eliminator, RCS exhaust HEPA filters: “HV-PDI-49, HV-PDI-50, HV-PDI-51”; FRM-154. RCS outlet HEPA filters: “HV-PDI-40, HV-PDI-41, HV-PDI-42, HV-PDI-43, HV-PDI-44, HV-PDI-45, HV-PDI-46, HV-PDI-47, HV-PDI-48”	—	—
33. RCS Flow Transmitter	Form-327. Ventilation monitoring screen, WES-CPU-1: “Main exhaust air flow”	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
34. RCS Inlet HEPA Filter Bank Housing (RCS inlet HEPA)	—	Form-371. Step 21: Verify each of the inlet HEPA filter duct openings is free of radiological contamination.	—
35. RCS Inlet HEPA Filter Bank Pressure Gauges	Form-327. RCS Inlet HEPA Filters: “HV-PDI-4, HV-PDI-5, HV-PDI-6, HV-PDI-7”	—	—
36. RCS Pressure Gauge/Transmitter	FRM-154. PGS #1: “HV-PDIT-1”	—	—
37. WES Inlet Filter Pressure Gauge	Form-327. PGS #1: “HV-PDI-1”	—	—
38. WES Penthouse Ductwork and Damper Assembly	—	—	—
39. WES Temperature Transmitter	—	—	—
40. Transfer Area Inlet Fan	—	—	—
Instrumentation and Control			
41. Closed-Circuit Television (CCTV)			
Camera control unit for gloveboxes	—	—	—
Camera control units for digface cameras	—	—	—
RCS cameras	—	—	—
PGS cameras	—	—	—
CCTV cabling	—	—	—
Excavator control panel	Form-292. Excavator preoperations check Step 9: “CCTV monitor is operable”	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Lockable video storage	—	—	—
Monitor input select switch	—	—	—
Monitor	—	—	—
Pan and tilt actuators (5)	—	—	—
Remote function control matrix	—	—	—
Video disc recorder	FRM-154. RCS outlet HEPA filters: “Closed-circuit television from previous shift’s recording is backed up per TPR-1802, set up and operate the CCTV System”	—	—
Video equipment racks	—	—	—
Video monitor display and mounting hardware	—	—	—
42. Criticality Alarm System (CAS)	—	Radiological Control (RadCon) presence to provide support to maintenance calibration	CA-RIA-1. Semiannual: “Calibration”
Control panel (CAS)	FRM-154. Criticality Alarm System, CA-RIA-1: “Station indicator #1-#3 Readout, first and second voting module indicating switch, Power supply module #1-#2 AC Power”	—	CA-RIA-1. Monthly: “Alarm testing”
Radiation alarm (CAS)	—	—	CA-RIA-1. Monthly: “Alarm testing”
Radiation primary element (CAS)	—	—	CA-RIA-1. Monthly: “Alarm testing”

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Radiation indicating alarm (CAS)	—	—	CA-RIA-1. Monthly: “Alarm testing”
Radiation switch (CAS)	—	—	CA-RIA-1. Monthly: “Alarm testing”
43. Drum Assay Trailer	—	RadCon presence to provide support; RadCon routine checklist—fissile material monitor (FMM) survey; RadCon routine checklist—drum laydown area survey; RadCon routine checklist—source storage survey	—
Heating and air for assay trailer	—	—	—
44. Advisory Alarm Switch with Yellow-Enclosure	—	—	—
45. Emissions Monitoring	Form-327. General Housekeeping. “Ensure emissions monitoring sample is obtained per TPR-1805”	RadCon presence to provide support to operations for changing sample of record	—
Air conditioning coil	—	—	RM-ACU-1 Air conditioner for the EMS. Monthly: “Inspect/clean inlet air filter and condenser coil”
Alpha constant air monitor (CAM) flow transmitter (box incorporating flow, pressure, and temperature transmitter as well as flow and temperature displays)	—	—	—
Data and power cabling	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Emissions monitoring cabinet	Form-327. Emissions Monitoring System, RM-CAB-1 at its door: “EMS cabinet temperature, Pump #1 failure, Pump #2 failure”	—	—
Pressure switch for Sample Pump #1	—	—	—
Pressure switch for Sample Pump #2	—	—	—
Sample lines	—	—	—
Sample of record flow transmitter (box incorporating flow, pressure, and temperature transmitter as well as flow and temperature displays)	—	—	—
Shrouded probes	—	—	—
Spare sample of record flow transmitter (box incorporating flow, pressure, and temperature transmitter as well as flow and temperature displays)	—	—	—
Stack flow transmitter (box incorporating flow, pressure, and temperature transmitter as well as flow and temperature displays)	—	—	—
Stack monitor alpha monitor	—	—	—
Total line pressure indicator	—	—	—
Total line pressure transmitter	—	—	—
Total line temperature transmitter	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
46. FMM System (PGS 1, 2, and 3)	—	RadCon routine checklist—FMM survey	—
Analyzer Control (Digi-dart)	—	—	—
Collimator	—	—	—
Data cabling	—	—	—
Electronic equipment cabinet	—	—	—
Eu-152 calibration sources	—	—	—
Flat panel computers	Form-327. General housekeeping. “Ensure the FMM panel PCs were backed-up during the previous shift to FMM host computer per TPR-1803”; Form-327. General Housekeeping. “Perform a hard reboot of the FMM computers by closing all programs and then turning off for about 15 seconds using the red ON/OFF switch on the back of the computer”	—	—
Host computer	—	—	—
Host printer	—	—	—
HP Ge detectors	—	—	—
Load cells	—	—	—
Monitor	—	—	—
Power cabling	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Refrigerator unit (X-cooler)	—	—	—
Sample bucket	—	—	—
Shielding	Form-301. Step 4: “FMM is secure and FMM shielding wall U-bolts are in place and secured”	—	—
UPS	Form-327. PGS #1: “FMM #1 UPS On line, FMM #1 UPS battery charge”; Form-327. PGS #2: “FMM #2 UPS On line, FMM #2 UPS battery charge”; Form-327. PGS #3: “FMM #3 UPS On line, FMM #3 UPS battery charge”	—	—
47. “Stack Fan On” Green Pilot Light	—	—	—
Life Safety Systems			
48. CO Gas Detectors	—	—	—
Carbon monoxide control panel	—	—	—
Carbon monoxide detectors	—	—	—
49. Emergency and Exit Lighting	—	—	N-N-0671 Emergency and Exit Lights: Monthly: “Visual and 30 second functional tests”; N-N-0671 Emergency and Exit Lights: Annual: “1.5 hr functional tests”

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
50. Emergency Equipment (eyewash station, communication, RadCon spill kits, first aid kits)	—	—	SFE-SFE-0000 Eyewash Station. Monthly: “Check for pressure, water levels, damage, lighting”; SFE-SFE-0000 Eyewash Station. Semiannual: “Check for pressure and lighting, flush system, add preservative”
51. Fire Protection—PGS	—	—	—
1/4-in. FNPT fire water pressure gauges (pump discharge to PGS)	Form-327. Diesel Fire Pump, FP-P-1: “Firewater pressure gauge FP-PI-2”	—	—
1-1/4-in. fire water flow meter	—	—	—
Ashcroft 0-400 PSI pressure gauge (overall pump discharge)	Form-327. Diesel Fire Pump, FP-P-1: “Firewater pressure gauge FP-PI-7103”	—	—
Battery enclosure	Form-327. Diesel Fire Pump, FP-P-1: “Battery No. 1 and 2”	—	—
Butterfly supervisory alarm switch	—	—	—
Diesel fire pump	Form-327. Diesel Fire Pump, FP-P-1: “Fire Pump Diesel Fuel Tank (level)”	—	FP-FP-0671 Fire Protection Diesel Pump. Weekly: “System inspection, Operational testing”; FP-FP-0671 Fire Protection Diesel Pump. Annual: “Electrical Maintenance, Controller Maintenance, Engine System Maintenance, Flow condition of pump”

Table E-1. (continued).

Material and Equipment Required (during retrieval operations)	Inspections		Maintenance
	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
850-gal fire protection tank	Form-327. Diesel Fire Pump, FP-P-1: "Firewater tank, FP-TK-1, Level (FP-LI-7101)"	—	—
Fire piping within the PGS	—	—	PGS fire suppression system (life safety system). Monthly: "Per NFPA 25"; PGS fire suppression system (life safety system). Semiannually: "PRD-158 Table 1b valve tamper switches and water flow devices and NFPA 72"; PGS fire suppression system (life safety system). Annually: "NFPA 25"
Level indicator on 850-gal fire protection tank	Form-327. Diesel fire pump, FP-P-1: "Firewater tank, FP-TK-1, level (FP-LI-7101)"	—	—
52. Fire Protection—RCS and WES Dry Pipe Systems	—	—	WMF-671 LSS (life safety system) PMs, fire alarm system. monthly, quarterly, semi-annual, annual: "Per PRD 158 Table 8a, 8b, and 8c"
Air temperature switch (low)	—	—	—
Fire alarm panel	—	—	—
Heat traces (FP-HTT-7101-02-03)	Form-327. Fire protection heat trace: "Check Breaker N-LP-2 #35"; Form-327. fire protection heat trace: "Check Breaker N-LP-7105 CKT 1"	—	—
Horn/strobe	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Hydrants (RCS wall hydrant header)	—	—	WMF-671 LSS PMs, hydrant header. monthly, semi-annual; WMF-671 LSS PMs, hydrant header. Annual: “Per PRD 158 Table 3a, 3b, and 3c”
Low air pressure supervisory switches	—	—	—
Manual fire alarm	—	—	—
Portable fire extinguishers	—	—	WMF-671 PMs, fire extinguishers. Monthly: “Inspect per PRD-158 Table 9a and 9b”; WMF-671 PMs, Fire Extinguishers. Quarterly: “Inspect per PRD-158 Tables 9a and 9b”; WMF-671 LSS PMs, fire Extinguishers. annual inspection
Post indicator valve	—	—	—
Sprinkler riser building (RCS)	—	—	WMF-671 LSS PMs, fire riser building 671. Monthly, Semi-annual, annual: “Per PRD 158 Table 1-1a, 1-1b, and 1-1c”
Strobe	—	—	—
Water flow alarm switches	—	—	—
RCS and WES dry pipe system	—	—	WMF-671 LSS PMs, RCS dry pipe system, WES dry pipe system. Monthly, quarterly, semi-annual, annual: “Per PRD 158 Table 1-2a, 1-2b, and 1-2c”

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
54. Fire Protection-RCS Deluge System	—	—	WMF-671 LSS PMs, RCS manual deluge system. Monthly, quarterly, semi-annual, annual: “Per PRD 158 Table 1-3a, 1-3b, and 1-3c”
Sprinkler riser building (deluge)	—	—	WMF-671 LSS PMs, fire riser building 671. Monthly, semi-annual, annual: “Per PRD 158 Table 1-1a, 1-1b, and 1-1c”
55. Fire Protection-Excavator Ansul Fire Protection System	Form-292. Step 3: “Fire suppression system is operational. (Green power LED is flashing and no alarm condition exists.)”	—	ANSUL fire protection system LSS Monthly and Semiannual: “Maintenance Manuals pp. 25, 7-1, and 8-1”
Radiological Controls			
56. Alpha CAMS (drum load out enclosure)	—	Daily operations check, daily filter change, weekly source check, monthly alarm check; Form-372. Step 14: “Verify installation and operation of an ALPHA 7 in-line continuous air monitor”	RME-CAM-RW1 to -RW15, RME-CAMCP-RW1 to -RW15, RM-RIA-7153 Alpha 7A CAM Calibration. Annual: “Calibrate per TPR-6245”

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
57. Alpha CAMS (WES)	—	Daily Op check, daily air activity-filter change, weekly source check, monthly alarm check, Semiannual source integrity check	RME-CAM-RW1 to -RW15, RME-CAMCP-RW1 to -RW15, RM-RIA-7153 Alpha 7A CAM Calibration. Annual: “Calibrate per TPR-6245”
EMS alpha CAM sample Pump #1 and #2	—	Maintenance support of pump-filter change	Vacuum pumps for environmental monitoring system. Monthly: “Inspect and replace filters”
Alpha CAM pumps	—	Maintenance support of pump-filter change	Vacuum pumps for environmental monitoring system. Monthly: “Inspect and replace filters”
58. Alpha/Beta Glovebox			
Alpha/beta scaler—smear counter (glovebox)	—	Daily operations check, daily source check	RME-SCTR-RW17 smear counters (scaler). Annual: “Calibrate per TPR 4930”
Smear counting glovebox	—	Form-373. Daily RadCon inspection	
59. Alpha/Beta Scaler-Smear counters (swipes)	—	Daily operations check, Daily source check	RME-SCLR-RW01, RME-SCLR-RW02 smear counters (scaler). Annual: “Calibrate per TPR 4930”
60. Beta CAMs	—	Daily operations check, weekly source check, weekly filter change, monthly alarm check	RME-BCAM-RW67 to -RW69 beta continuous air monitors. Annual: “Calibrate per TPR-843”
61. Hand Held Alpha and Beta/Gamma Surveyor	—	Daily operations check, daily source check	—
62. Hand Held Dose Rate Survey Meters	—	Daily operations check, daily source check	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
63. Hand Held Neutron Surveyor	—	Daily operations check, weekly source check	—
64. Hand Alpha Survey Meter	—	Daily operations check, daily source check	—
65. Lapel air samplers	—	IH calibration prior to use	—
66. Portable Air Samplers	—	—	—
67. Radiological Monitoring—Personal Contamination Monitors (PCMs)	—	Daily operations check, weekly source check	RME-PCM-RW10, RME-PCM-RW11 PCM-2 Calibration. Annual: “Calibrate Per TPR-190”
68. Radiological Monitoring—Radiation Area Monitors	—	Daily operations check, weekly source check, monthly alarm check	—
69. Radiological Monitoring—Radiological Control Information Monitoring System	—	As needed Radiological Control Information Monitoring System support	—
Structures			
70. All Modular Paneled Structures within the WES	—	—	—
Emergency exit vestibule	—	Form-371. Step 10: RCS door is closed and adequately taped (when not in use).	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Personnel access room	—	Form-371. Step 10: RCS door is closed and adequately taped (when not in use). Form-371. Step 21: Verify each of the inlet HEPA filter duct openings is free of radiological contamination.	—
Personnel monitoring room	—	RadCon routine checklist—daily control point survey	—
RCS	—	Form-371. Step 19: Verify that RCS wall and wall/floor interface are free of radiological contamination. Form-371. Step 20: Verify that no obvious cracking is present on the RCS walls, floor, windows, and ceiling.	—
Locking rings, glove ports, bagout ports, glove port covers, support rings, gloves and bags (installed)	—	Form-371. Step 1 and 2: Inspection for glove integrity, proper installation, and radiological contamination. Form-371. Step 7: Inspection for bag port integrity and proper installation. Form-371. Step 8: Inspection for transfer port radiological contamination. Form-371. Step 15: Inspection for utility port cover seals.	—
Transfer area	—	Form-371. Step 10: RCS door is closed and adequately taped (when not in use).	—

Table E-1. (continued).

Material and Equipment Required (during retrieval operations)	Inspections		Maintenance
	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
71. Drum Load Out Enclosures	—	—	—
Drum load out Enclosures (Tents)	Form-301. Step 1: “RCT inspection of PGS drum bag-out enclosure and RCS are current”; FRM-154. PGS-all: “PGS#1—#3 tent combustible supplies limited to those necessary to support a single shift of operations and excess waste removed; as viewed through the tent windows”; FRM-154. PGS-all: “PGS#1—#3 Area marked outside tent below platform is free from storage of combustible materials”	Form-372. Step 2. “Verify outer door zippers and Velcro seals are not damaged, function properly and that they are free of radiological contamination”; Form-372. Step 3. “Verify integrity of windows, doors, seams, penetrations and fixtures and that they are free of radiological contamination”; Form-372. Step 5. “Verify the integrity of the HEPAfiltered ventilation system’s connections to the tent”; Form-372. Step 6. “Verify tent is free of tears, loose seams, cuts, or any other loss of integrity”; RadCon Routine Checklist—Weekly smoke test of containment tents	—
Drum load out enclosures (filter stands)	—	—	—
Drum load out lift tables	—	Form-372. Step 1: “Verify hand tools, drum lifts, and other components are covered where possible to minimize decontamination”	—
72. Exhaust Stack	—	—	—
Exhaust stack drain	Form-327. Main exhaust: “Main stack is drained per TPR-1805”	—	—
Structural support and foundation	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
73. Facility Floor Structure	—	—	—
Floor decking and plate	—	—	—
Floor framing	—	—	—
Floor structure (inside RCS)	—	—	—
Floor structure (outside RCS)	—	—	—
Temporary floor plate (for equipment weight distribution)	—	—	—
74. Packaging Glovebox System	—	—	—
Cart protection spill pan	—	—	—
Cart protection structure	—	—	—
Glovebox drum-out ring covers	—	—	—
Glovebox windows	—	Form-372. Step 14: “Verify three randomly selected areas of the outside of PGS walls are free of radiological contamination.”	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Locking rings, glove ports, bagout ports, glove port covers, support rings, double door transfer container (french can), gloves (installed)	—	Form-372. Step 1: “Verify all gloves are inspected for integrity and proper installation.”; Form-372. Step 2: “Verify that external surfaces of all gloves are free of radiological contamination”; Form-372. Step 5: “Verify Bag-in/bag-out port is inspected for integrity and proper installation of transfer sleeve”; Form-372. Step 6: “Verify Bag-in/bag-out port is free of radiological contamination”; Form-372. Step 7: “Verify the exterior surfaces of the double door transfer container are free of radiological contamination”; Form-372. Step 15: “Verify the exterior surfaces of two blank gloveport covers (randomly selected) are free of radiological contamination.”	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Hoist, hoist motor, and hoist trolley	Form-301. Step 3: “Perform functional check of the glovebox hoist: (1) any obstructions to the use of the hoist, (2) check upper limit switch, (3) hoist moves in the commanded directions, (4) check trolley limit switches, (5) check hook for deformation, chemical or heat damage, or cracks, (6) check that hook swivels freely, (7) inspect chain for nicks, gouges, distortion, wear, cracks, and corrosion, and (8) inspection tag is current.”	—	PG-PGS-0671 Project glovebox hoists. Monthly: “Inspection of hoist components”
Manual controller	—	—	—
Material transfer cart system	—	—	—
Drive system, drive motor, and drive screw	—	—	—
Drive transfer cart and auxiliary transfer cart	—	—	—
Motor starters and cart motor VFD	—	—	—
Shaft seal	—	Form-372. Step 14: “Verify three randomly selected areas of the outside of PGS walls are free of radiological contamination.”	—
Speed reducer	—	—	—
Operating platforms	—	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Packaging gloveboxes	Form-301. Step 2: “One to two gallons of fire suppressant and absorbent are staged in the glovebox”	Form-372. Step 14: “Verify three randomly selected areas of the outside of PGS walls are free of radiological contamination.”	—
PGS/RCS boot seal	—	Form-371. Step 5: Verify the visible and readily accessible portions of the PGS-to-RCS interface gasket are free of obvious damage. Form-371. Step 6: Verify that the gasket provides an adequate seal by doing a radiological survey of the readily accessible portions of the PGS-to-RCS interface gasket; Form-372. Step 3: “Verify gasket between the PGS and RCS is inspected for integrity”; Form-372. Step 4: “Verify the readily accessible portions of the exterior gasket between the PGS and RCS are free of radiological contamination.”	—
PGS glovebox lighting	—	—	—
75. Trailers—RadCon			
Change trailer	—	RadCon routine checklist—change trailer survey	—
RCT trailer	—	RadCon Routine checklist—RCT trailer survey	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
76. Weather Enclosure Structure	—	—	—
Computer (HVAC and EMS)	Form-327. Ventilation monitoring screen, WES-CPU-1: “WES ambient temperature and main exhaust air flow”; Form-327. emissions monitoring screen, WES-CPU-1: “WES ambient temperature, stack flow, sample of record flow, sample flow alpha CAM, total stack flow, total sample flow”; Form-327, emissions monitoring screen, WES-CPU-1: “total stack flow, Total sample flow”	—	—
Interior and exterior WES lighting (normal power)	—	—	—
Interior and exterior WES lighting (standby power)	—	—	—
Uninterruptible power supply (UPS)	Form-327. WES-UPS-800: “On line,” Form-327. WES-UPS-800: “Battery charge,” Form-327. WES-UPS-1: “On line.” Form-327. WES-UPS-1: “LCD display screen”	—	—
WES	—	RadCon routine checklist—Weekly WMF-671 Survey; RadCon routine checklist—Daily 4 hour air sample	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
Miscellaneous			
77. Dust Suppression System	—	—	—
Control panel	—	—	—
Electric resistance heater	—	—	—
Manual controller, hand control	—	—	—
Level switch low	—	—	—
Pump	—	—	—
Receiver tank	Form-327. plant air: “DSS tank, DS-TK-7101, fluid level”	—	—
Solenoid valve	—	—	—
Temperature element, primary	—	—	—
Water filter	—	—	—
78. Electric Drum Handler (in WES)	Form-327. General housekeeping: “Drum handler(s) battery charged at or near capacity”	—	—
79. Electric Drum Handler Charging Station	—	—	Annual inspection
80. Electronic Scale (drum weight)	—	—	Annual calibration
81. Fire Suppression Material (magnesium oxide)	Form-327. General housekeeping. “RCS ...magnesium oxide sand (fire suppressant) bins are at least 3/4 full using the yellow line as the full mark”	—	—

Table E-1. (continued).

	Inspections		Maintenance
Material and Equipment Required (during retrieval operations)	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
82. Forklift	—	—	LD-FL-RW01 forklift battery. Monthly: “Check SG, temp, volt, electrolyte level”
83. Laundry (used for RCS entry or PGS work)	—	RadCon routine checklist—RWMC clean laundry survey	—
84. Liquid absorbent (WYK safety sorbent)	Form-327. General housekeeping. “RCS liquid absorbent bins are at least 3/4 full using the yellow line as the full mark”	—	—
85. Material Bins	—	—	—
86. Overburden Chamber/Cartridge Assembly	—	—	WMF-671 overburden lift assembly hoist. Monthly: “Check brake slippage, controls operability, check limit switches, visually inspect hook, inspect/clean chain”
87. Overburden Soil Sacks (full)	—	—	—
88. Personnel Lockers	—	—	—
89. Pit Guard Rail/Fall Protection	—	—	—
90. Portable electric tools (Sawzall, Nibbler, shop vac, long list of hand tools, 55-gal drum rigging)	—	—	—
91. Portable HEPA Vacuums	—	RadCon routine checklist— portable HEPA vacuums survey	—
92. Storage Cabinets	—	—	—
93. Underburden Sampling Equipment (tubes and shipping containers)	—	—	—

Table E-1. (continued).

Material and Equipment Required (during retrieval operations)	Inspections		Maintenance
	Operations Inspections	Radiological Control and Industrial Hygienist Inspections	Maintenance and Life Safety Preventive Maintenance
94. Waste Sampling Equipment (french cans, sample refrigerator, spoons, bottles, pipettes)	Form-327. Sample refrigerator: “Sample refrigerator temperature”	—	—
95. Sample Shipping Containers	Form-461.02	—	—



Appendix F

Underburden Sample Results

Appendix F

Underburden Sample Results

Underburden core sampling performed by the OU 7-10 Glovebox Excavator Method Project was to characterize underburden soil to collect data on contaminants of interest to support subsurface migration evaluations.^a Five cores and one duplicate location were sampled for project evaluation. Subsamples were collected from various core intervals to support identification of concentration gradients as a function of depth including radiological measurements using both alpha and gamma spectroscopy, volatile organic compound measurements using gas chromatography mass spectroscopy, and soluble anions and cations (and metals) using ion chromatography and inductively coupled plasma, respectively. The results from analyses of the underburden cores are included in Tables F-1 through F-5.

a. The Project work scope did not include performance of these subsurface migration evaluations.

Table F-1. Planned vs. actual underburden core locations.

Core Name	Planned Actual (date collected)	Radius (r) \pm 0.5 ft (from excavator pivot point [origin], [ft])	Approximate True Angle $\theta \pm 5$ (degrees)	Approximate Apparent Angle $\theta \pm 5$ (degrees)	Depth Range (ft)	Number of Intervals Sampled at Laboratory
P9-CORE-1 ^a	Planned	10.5	37	59	11 to 12.5	3+ 4-in intervals
	Actual (02/08/04)	10.6	37	—	14.98	5 (4 @ 4 in.; 1 @ 2 in.) intervals
P9-CORE-2 ^a	Planned	8	52	70	11 to 13	6 4-in intervals
	Actual (02/08/04)	8.0	52	—	16.08	6 (5 @ 4 in.; 1 @ 2 in.) intervals
P9-CORE-3 ^b	Planned	9.5	72	80	11 to 16	13+ 4-in intervals
	Actual (02/20/04)	11.56	80	—	15.5	6 4-in intervals
P9-CORE-4 ^b	Planned	14	95	93	11 to 15	12 4-in intervals
	Actual (02/20/04)	10.96	100	—	15.4	5 (4 @ 4 in.; 1 @ 3.5 in.) intervals
P9-CORE-5A ^a	Planned	12	117	107	11 to 12.5	3+ 4-in intervals
	Actual (02/20/04)	8.8	120	—	14.59	6 4-in intervals
P9-CORE-5B ^b	Planned	11.5	117	107	11 to 12.5	3+ 4-in intervals (quality control duplicates)
	Actual (02/20/04)	11.08	110	—	15.69	3 4-in intervals

a. In certain subsamples from Cores 1, 2, and 5A that have low levels of TRU contaminants, the variations in the relative abundance of Pu-239 and Am-241 are suggestive of chemical transport processes, and indicate that these core subsamples may provide suitable material for future evaluations of in situ contaminant migration.

b. Preliminary evaluation of the relative abundance of TRU elements within subsamples from Cores 3, 4, and 5B suggests that this contamination most likely resulted from mixing of waste and underburden soil during waste retrieval.

Table F-2. Alpha spectroscopy results for underburden core samples.^{a,b}

OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT					Underburden Sample Alpha Spectroscopy Results By Analyte (in pCi/g)																						
Underburden Core Location	Analysis Method	Sample Number	Sample Level Top (in inches)	Sample Level Bottom (in inches)	Am-241		Validation Qualifier	Np-237		Validation Qualifier	Pu-238		Validation Qualifier	Pu-239		Validation Qualifier	U-234		Validation Qualifier	U-235		Validation Qualifier	U-238		Validation Qualifier		
					Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty
P9-CORE-1	Alpha Spec	P9GU1A019A	0	4	1.02E+00	2.08E-01		5.28E-01	5.40E-02	J			U	1.42E-01	4.24E-02	J	5.01E-01	1.12E-01				U	7.83E-01	1.72E-01			
		P9GU1B019A	4	8			UJ	5.81E-01	5.92E-02		6.89E-02	2.53E-02	J	1.47E+00	2.61E-01		6.63E-01	1.50E-01				U	9.07E-01	2.06E-01			
		P9GU1C019A	8	12			UJ	6.68E-01	7.01E-02				U	2.68E-01	6.62E-02	J	8.48E-01	1.75E-01		7.09E-02	2.87E-02	J	7.76E-01	1.73E-01			
		P9GU1E019A	12	16			U	5.78E-01	8.51E-02				U	2.60E-01	6.41E-02	J	4.57E-01	1.05E-01				U	8.03E-01	1.76E-01			
		-	20	22+	-	-		-	-		-	-		-	-		-	-		-	-		-	-			
P9-CORE-2	Alpha Spec	P9GU2A019A	0	4	1.60E+02	2.39E+01		7.44E-01	9.90E-02		2.19E+00	4.19E-01		9.38E+01	1.48E+01		7.44E-01	1.67E-01		5.07E-02	2.37E-02	J	4.59E-01	1.17E-01			
		P9GU2B019A	4	8			UJ			U	3.32E-02	1.57E-02	J	1.77E-01	5.02E-02	J	9.30E-01	2.02E-01		5.60E-02	2.54E-02	J	5.05E-01	1.27E-01			
		P9GU2C019A	8	12			U	5.59E-01	8.63E-02	J			U	5.88E-02	2.24E-02	J	7.82E-01	1.73E-01		1.00E-01	3.71E-02	J	4.90E-01	1.23E-01			
		P9GU2E019A	12	16			U	6.42E-01	6.08E-02		5.86E-02	2.60E-02	J	1.70E-01	4.80E-02	J	5.37E-01	1.28E-01		6.11E-02	2.69E-02	J	5.62E-01	1.39E-01			
		P9GU2G019A	20	22+			UJ	4.24E-01	4.91E-02	J	5.86E-02	2.60E-02	J	1.70E-01	4.80E-02	J	4.08E-01	9.74E-02				U	3.86E-01	9.73E-02			
P9-CORE-3	Alpha Spec	P9GU5A019A	0	4	2.29E+03	3.51E+02		1.94E+01	2.01E+00		2.25E+02	2.86E+01		1.30E+04	1.45E+03		2.37E+00	5.36E-01	J				U	4.11E-01	1.49E-01	J	
		P9GU5B019A	4	8	6.80E+01	1.31E+01		5.35E-01	1.87E-01	J	1.29E+02	1.79E+01		1.17E+02	1.71E+01		1.07E+00	3.16E-01	J				UJ	6.97E-01	2.31E-01	J	
		P9GU5C019A	8	12	2.36E+00	4.43E-01		1.17E-01	2.24E-02				UJ	1.40E+01	1.38E+00		7.21E-01	1.50E-01	J				UJ	3.83E-01	9.46E-02	J	
		P9GU5E019A	12	16	1.58E+01	2.75E+00		6.13E-01	9.44E-02				UJ	2.38E+00	3.49E-01		5.40E-01	1.32E-01	J				U	4.43E-01	1.18E-01	J	
		P9GU5G019A	20	22+	3.80E+00	6.31E-01		5.59E-01	8.77E-02				UJ	1.47E+00	2.26E-01	J				UJ				U			UJ
P9-CORE-4	Alpha Spec	P9GU6A019A	0	4	1.36E+03	2.34E+02		3.48E+00	9.22E-01		1.27E+02	1.94E+01		6.15E+03	7.59E+02					UJ				U			U
		P9GU6B019A	4	8	2.25E+03	4.58E+02		1.20E+01	1.68E+00		1.48E+02	3.05E+01		6.70E+03	1.18E+03		1.01E+00	4.16E-01	J				U			U	
		P9GU6C019A	8	12	1.72E+03	3.12E+02		1.14E+01	1.11E+00		1.12E+02	2.02E+01		7.10E+03	1.04E+03		1.13E+01	2.18E+00		6.30E-01	2.64E-01	J	4.94E-01	2.08E-01	J		
		P9GU6E019A	12	16	8.53E+02	1.33E+02		1.83E+00	2.97E-01		5.95E+01	1.15E+01		3.70E+03	5.38E+02		6.59E-01	2.48E-01	J				U			UJ	
		P9GU6G019A	20	22+	4.26E+02	7.07E+01		2.87E+00	4.39E-01		3.04E+01	5.94E+00		1.74E+03	2.60E+02					UJ				U			UJ
P9-CORE-5A	Alpha Spec	P9GU3A019A	0	4	9.26E+03	1.71E+03		3.67E+01	1.02E+01		9.96E+02	2.93E+02		5.85E+04	9.65E+03		2.06E+00	5.93E-01					U			U	
		P9GU3B019A	4	8	5.94E+04	1.13E+04		1.44E+01	6.24E+00		3.45E+03	7.54E+02		2.24E+05	3.43E+04		4.88E+00	1.11E+00	J	7.91E-01	3.23E-01	J	9.18E-01	3.22E-01	J		
		P9GU3C019A	8	12	4.65E+00	9.23E-01				U			U	1.13E+01	2.21E+00		1.51E+00	4.36E-01					U			U	
		P9GU3E019A	12	16	7.61E+02	1.57E+02				U	4.59E+01	1.61E+01	J	2.66E+03	4.56E+02		8.01E-01	3.59E-01	J				U	7.46E-01	3.22E-01	J	
		P9GU3G019A	20	22+	2.50E+00	5.78E-01		5.22E-01	9.41E-02		7.78E-01	3.25E-01	J	1.21E+01	2.30E+00		4.85E-01	2.15E-01	J				U	3.91E-01	1.95E-01	J	
P9-CORE-5B	Alpha Spec	P9GU4A019A	0	4	9.94E+03	1.79E+03		3.03E+01	1.07E+01	J	6.13E+02	2.24E+02	J	5.08E+04	9.12E+03		1.37E+00	6.10E-01	J				U			U	
		P9GU4B019A	4	8	3.69E+03	5.94E+02		2.58E+00	2.89E-01		1.94E+02	3.83E+01		1.10E+04	1.89E+03		1.90E+00	6.18E-01					U			U	
		P9GU4C019A	8	12	1.12E+03	1.68E+02		1.53E+00	1.88E-01		8.19E+01	1.70E+01		5.14E+03	8.69E+02		1.18E+00	3.73E-01	J				U			U	
		-	12	16	-	-		-	-		-	-		-	-		-	-		-	-		-	-			
		-	20	22+	-	-		-	-		-	-		-	-		-	-		-	-		-	-			
<div><div>Data Validation Flags:</div><div><div>none = The analysis was performed and radioactivity was detected (i.e., the radioanalytical result is statistically positive at the 95% confidence level and is above the MDC). <i>The radionuclide is considered to be present in the sample.</i></div><div>U = The analysis was performed, but no radioactivity was detected (i.e., the radioanalytical result was not statistically positive at the 95% confidence level and/or the result was below the MDC). <i>The radionuclide is not considered to be present in the sample.</i> Values associated with "U" flagged results are not provided.</div><div>J = The analysis was performed and radioactivity was detected (i.e., the radioanalytical result is statistically positive at the 95% confidence level and is above the MDC). However, the result is questionable due to analytical and/or laboratory quality control anomalies and should therefore be used only as an estimated (approximated) quantity. Analytical and/or quality control anomalies include items such as: laboratory duplicate imprecision, unsatisfactory analytical yields, insufficient laboratory control sample recoveries, unacceptable PE sample results, instrument calibration problems, improper sample preservation, etc. <i>The radionuclide is considered to be present, but the result may be inaccurate or imprecise.</i></div><div>UJ = The analysis was performed and the result is highly questionable due to serious analytical and/or laboratory quality control anomalies. The use of such a result is strongly discouraged. Serious analytical and/or quality control anomalies include items such as: significant blank contamination, known photopeak interferences or photopeak resolution problems, known matrix interferences, unacceptable laboratory control sample recoveries, serious instrument calibration problems, improper sample preservation, etc. <i>The radionuclide may or may not be present and the result is considered highly questionable.</i> Values associated with "UJ" flagged results are not provided.</div></div><div>- " = No sample obtained at specified depth.</div></div>																											
<div><div>Footnotes:</div><div><div>a. In certain subsamples from Cores 1, 2, and 5A that have low levels of TRU contaminants, the variations in the relative abundance of Pu-239 and Am-241 are suggestive of chemical transport processes, and indicate that these core subsamples may provide suitable material for future evaluations of in situ contaminant migration.</div><div>b. Preliminary evaluation of the relative abundance of TRU elements within subsamples from Cores 3, 4, and 5B suggests that this contamination most likely resulted from mixing of waste and underburden soil during waste retrieval.</div></div></div>																											

Table F-3. Gamma spectroscopy results for underburden core samples.^{a,b}

OU 7-10 GLOVEBOX EXCAVATOR METHOD PROJECT					Underburden Sample Gamma Spectroscopy Results By Analyte (in pCi/g) ^a																								
Underburden Core Location	Analysis Method	Sample Number	Sample Level Top (in inches)	Sample Level Bottom (in inches)	Am-241		Validation Qualifier	Cs-137		Validation Qualifier	Np-237		Validation Qualifier	Pa-233		Validation Qualifier	Pu-239		Validation Qualifier	Pu-241		Validation Qualifier	Th-234		Validation Qualifier	U-237		Validation Qualifier	
					Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		Concentration	Uncertainty		
P9-CORE-1	Gamma Spec	P9GU1A019A	0	4	1.06E+00	1.20E-01		9.30E-02	1.24E-02				U			U			U			U	1.16E+01	2.76E+00				U	
		P9GU1B019A	4	8			U			U			U			U			U			U	1.26E+01	1.91E+00				U	
		P9GU1C019A	8	12			U			U			U			U			U			U	1.25E+01	2.23E+00				U	
		P9GU1E019A	12	16			U			U			U			U			U			U				U			U
		-	20	22+	-	-		-	-		-	-		-	-		-	-		-	-		-	-		-	-		
P9-CORE-2	Gamma Spec	P9GU2A019A	0	4	4.71E+01	3.64E+00				U			U			U			U			U			U				U
		P9GU2B019A	4	8			U			U			U			U			U			U	8.63E+00	2.32E+00				U	
		P9GU2C019A	8	12			U			U			U			U			U			U	8.04E+00	2.63E+00				U	
		P9GU2E019A	12	16	1.70E-01	2.17E-02				U			U			U			U			U	8.12E+00	2.67E+00				U	
		P9GU2G019A	20	22+			U			U			U			U			U			U	8.60E+00	1.96E+00				U	
P9-CORE-3	Gamma Spec	P9GU5A019A	0	4	5.67E+02	5.32E+01		1.68E-01	1.68E-02	J			U			U	1.49E+03	1.89E+02				U			U				U
		P9GU5B019A	4	8	3.75E+00	4.66E-01		9.52E-02	1.99E-02	J			U			U			U			U				U			U
		P9GU5C019A	8	12			U			U			U			U			U			U				U			U
		P9GU5E019A	12	16			U			U			U			U			U			U				U			U
		P9GU5G019A	20	22+			U			U			U			U			U			U				U			U
P9-CORE-4	Gamma Spec	P9GU6A019A	0	4	4.37E+03	3.49E+02		1.57E-01	1.75E-02	J			U			U	1.54E+04	1.52E+03				U			U				U
		P9GU6B019A	4	8	4.57E+03	3.56E+02		3.14E-01	4.16E-02	J			U			U	1.64E+04	1.26E+03				U			U	7.55E+00	6.64E-01		
		P9GU6C019A	8	12	4.51E+03	3.46E+02		1.40E-01	1.36E-02	J			U			U	1.49E+04	1.37E+03				U			U	5.92E+00	6.36E-01		
		P9GU6E019A	12	16	3.32E+02	3.19E+01				U			U			U	1.34E+03	1.30E+02				U			U				U
		P9GU6G019A	20	22+	6.03E+02	5.68E+01		6.99E-02	1.50E-02	J			U			U	2.09E+03	1.89E+02				U			U				U
P9-CORE-5A	Gamma Spec	P9GU3A019A	0	4	7.90E+03	5.89E+02		8.72E-02	1.25E-02	J	8.94E-01	2.23E-01				U	3.09E+04	2.55E+03				U			U	1.97E+00	2.57E-01		
		P9GU3B019A	4	8	1.68E+04	1.13E+03		1.10E-01	1.38E-02	J			U			U	7.49E+04	6.55E+03		9.22E+04	1.78E+04			U	5.39E+00	5.29E-01			
		P9GU3C019A	8	12	2.07E+00	3.14E-01				U	1.02E+00	2.19E-01				U			U			U							U
		P9GU3E019A	12	16	5.81E+02	5.43E+01		9.73E-02	1.90E-02	J			U			U	2.06E+03	1.98E+02				U			U				U
		P9GU3G019A	20	22+	9.73E-01	1.31E-01				U	8.90E-01	2.17E-01				U			UJ			U			U				U
P9-CORE-5B	Gamma Spec	P9GU4A019A	0	4	7.58E+04	5.23E+03		4.92E-01	5.84E-02	J			U	1.03E+00	1.26E-01		2.77E+05	1.72E+04		3.67E+05	5.87E+04				U	2.27E+01	1.72E+00		
		P9GU4B019A	4	8	1.02E+04	7.58E+02		8.50E-01	9.30E-02	J			UJ			U	3.58E+04	2.63E+03		5.22E+04	9.15E+03				U	2.93E+00	3.91E-01		
		P9GU4C019A	8	12	7.99E+03	6.23E+02		2.45E-01	2.63E-02	J			U			U	2.95E+04	2.15E+03				U			U	2.90E+00	3.92E-01		
		-	12	16	-	-		-	-		-	-		-	-		-	-		-	-		-	-		-	-		
		-	20	22+	-	-		-	-		-	-		-	-		-	-		-	-		-	-		-	-		
<div><div>Data Validation Flags:</div><div><div>none = The analysis was performed and radioactivity was detected (i.e., the radioanalytical result is statistically positive at the 95% confidence level and is above the MDC). The radionuclide is considered to be present in the sample.</div><div>U = The analysis was performed, but no radioactivity was detected (i.e., the radioanalytical result was not statistically positive at the 95% confidence level and/or the result was below the MDC). The radionuclide is not considered to be present in the sample. Values associated with "U" flagged results are not provided.</div><div>J = The analysis was performed and radioactivity was detected (i.e., the radioanalytical result is statistically positive at the 95% confidence level and is above the MDC). However, the result is questionable due to analytical and/or laboratory quality control anomalies and should therefore be used only as an estimated (approximated) quantity. Analytical and/or quality control anomalies include items such as: laboratory duplicate imprecision, unsatisfactory analytical yields, insufficient laboratory control sample recoveries, unacceptable PE sample results, instrument calibration problems, improper sample preservation, etc. The radionuclide is considered to be present, but the result may be inaccurate or imprecise.</div><div>UJ = The analysis was performed and the result is highly questionable due to serious analytical and/or laboratory quality control anomalies. The use of such a result is strongly discouraged. Serious analytical and/or quality control anomalies include items such as: significant blank contamination, known photopeak interferences or photopeak resolution problems, known matrix interferences, unacceptable laboratory control sample recoveries, serious instrument calibration problems, improper sample preservation, etc. The radionuclide may or may not be present and the result is considered highly questionable. Values associated with "UJ" flagged results are not provided.</div></div><div>" - " = No sample obtained at specified depth.</div></div>																													
<div>a. Analytes for gamma spectroscopy also included Ag-108m, Ag-110m, Ce-144, Co-60, Cs-134, Eu-152, Eu-154, Eu-155, Mn-54, Ru-106, Sb-125, and Zn-65. Results for these radionuclides are not shown as they were not detected.</div>																													
<div><div>Footnotes:</div><div><div>a. In certain subsamples from Cores 1, 2, and 5A that have low levels of TRU contaminants, the variations in the relative abundance of Pu-239 and Am-241 are suggestive of chemical transport processes, and indicate that these core subsamples may provide suitable material for future evaluations of in situ contaminant migration.</div><div>b. Preliminary evaluation of the relative abundance of TRU elements within subsamples from Cores 3, 4, and 5B suggests that this contamination most likely resulted from mixing of waste and underburden soil during waste retrieval.</div></div></div>																													

Table F-4. Volatile organic compound results for underburden core samples.

OU 7-10 Glovebox Excavator Method Project		Underburden Sample Volatile Organic Compound Results by Core Location																		
		Underburden Core Location	P9-CORE-5B			P9-CORE-5A			P9-CORE-4			P9-CORE-3			P9-CORE-2			P9-CORE-1		
		Sample Series Number	P9GU4			P9GU3			P9GU6			P9GU5			P9GU2			P9GU1		
Compound	Analysis Method	Sample Segment ID	Sample Top - Bottom (in inches)	Compound Concentration (in ug/kg)	Data Validation Flag	Sample Top - Bottom (in inches)	Compound Concentration (in ug/kg)	Data Validation Flag	Sample Top - Bottom (in inches)	Compound Concentration (in ug/kg)	Data Validation Flag	Sample Top - Bottom (in inches)	Compound Concentration (in ug/kg)	Data Validation Flag	Sample Top - Bottom (in inches)	Compound Concentration (in ug/kg)	Data Validation Flag	Sample Top - Bottom (in inches)	Compound Concentration (in ug/kg)	Data Validation Flag
1,1,1-Trichloroethane	SW8260B	B	4 - 8	8.80E+00	J	4 - 8	2.30E+00	J	4 - 8	4.00E+01	J	4 - 8	3.10E+04	J	4 - 8		U	4 - 8		U
1,1,2,2-Tetrachloroethane	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8	1.20E+01	J	4 - 8	2.50E+03	J	4 - 8		U	4 - 8		U
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	2.90E+01	J	4 - 8		U	4 - 8		U
1,1,2-Trichloroethane	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	3.00E+01	J	4 - 8		U	4 - 8		U
1,1-Dichloroethane	SW8260B	B	4 - 8		U	4 - 8		UJ	4 - 8	2.40E+00	J	4 - 8	1.30E+02	J	4 - 8		U	4 - 8		U
1,1-Dichloroethene	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	3.60E+00	J	4 - 8		UZ	4 - 8		UZ
1,2-Dichloroethane	SW8260B	B	4 - 8		UJ	4 - 8		UM	4 - 8		UJ	4 - 8	7.90E+01	J	4 - 8		UJ	4 - 8		UJ
1,2-Dichloropropane	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	1.20E+01	J	4 - 8		U	4 - 8		U
2-Butanone	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	3.50E+01	J	4 - 8		U	4 - 8		U
2-Hexanone	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	9.60E+00	J	4 - 8		U	4 - 8		U
4-Methyl-2-pentanone	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	2.70E+02	J	4 - 8	1.90E+01		4 - 8	8.10E+00	J
Acetone	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	2.40E+02	J	4 - 8		U	4 - 8	1.00E+01	J
Benzene	SW8260B	B	4 - 8		UJ	4 - 8		UJ	4 - 8		UJ	4 - 8	1.60E+01	J	4 - 8		UJ	4 - 8		UJ
Carbon tetrachloride	SW8260B	B	4 - 8	1.90E+01		4 - 8	4.40E+01		4 - 8	5.20E+02	J	4 - 8	1.20E+05	J	4 - 8		U	4 - 8		U
Chloroform	SW8260B	B	4 - 8	1.50E+01		4 - 8	8.60E+00	J	4 - 8	3.70E+02	J	4 - 8	1.50E+04	J	4 - 8		U	4 - 8		U
cis-1,2-Dichloroethene	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	5.00E+00	J	4 - 8		U	4 - 8		U
Ethylbenzene	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	4.20E+01	J	4 - 8		U	4 - 8		U
Methylene chloride	SW8260B	B	4 - 8		UJ	4 - 8		UJ	4 - 8		UJ	4 - 8	2.50E+01	J	4 - 8		UJ	4 - 8		U
o-Xylene	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	7.80E+01	J	4 - 8		U	4 - 8		U
Tetrachloroethene	SW8260B	B	4 - 8	4.80E+01		4 - 8	5.10E+01	J	4 - 8	3.20E+03	J	4 - 8	2.50E+06	J	4 - 8		U	4 - 8		U
Toluene	SW8260B	B	4 - 8		UZ	4 - 8		UZ	4 - 8	4.00E+00	J	4 - 8	1.10E+04	J	4 - 8		UZ	4 - 8		UZ
Trichloroethene	SW8260B	B	4 - 8	2.50E+01	Z	4 - 8	5.00E+01	Z	4 - 8	5.40E+02	J	4 - 8	1.30E+05	J	4 - 8		UZ	4 - 8		UZ
Xylene, meta and/or para isomers	SW8260B	B	4 - 8		U	4 - 8		U	4 - 8		UJ	4 - 8	1.80E+02	J	4 - 8		U	4 - 8		U
1,1,1-Trichloroethane	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24	5.40E+00	J	20 - 22		U	16 - 18		U
1,1,2,2-Tetrachloroethane	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
1,1,2-Trichloroethane	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
1,1-Dichloroethane	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
1,1-Dichloroethene	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		UZ	16 - 18		UZ
1,2-Dichloroethane	SW8260B	G	-	-		20 - 24		UJ	20 - 23.5		UJ	20 - 24		UJ	20 - 22		UJ	16 - 18		UJ
1,2-Dichloropropane	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
2-Butanone	SW8260B	G	-	-		20 - 24		U	20 - 23.5	1.70E+01	J	20 - 24		UJ	20 - 22		U	16 - 18		U
2-Hexanone	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
4-Methyl-2-pentanone	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24	3.00E+01	J	20 - 22		U	16 - 18		U
Acetone	SW8260B	G	-	-		20 - 24		U	20 - 23.5	5.50E+02	J	20 - 24		UJ	20 - 22		U	16 - 18		U
Benzene	SW8260B	G	-	-		20 - 24		UJ	20 - 23.5		UJ	20 - 24		UJ	20 - 22		UJ	16 - 18		UJ
Carbon tetrachloride	SW8260B	G	-	-		20 - 24		U	20 - 23.5	2.20E+00	J	20 - 24	7.20E+00	J	20 - 22		U	16 - 18		U
Chloroform	SW8260B	G	-	-		20 - 24		U	20 - 23.5	1.00E+01	J	20 - 24	3.00E+01	J	20 - 22		U	16 - 18		U
cis-1,2-Dichloroethene	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
Ethylbenzene	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
Methylene chloride	SW8260B	G	-	-		20 - 24		UJ	20 - 23.5		UJ	20 - 24		UJ	20 - 22		UJ	16 - 18		U
o-Xylene	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
Tetrachloroethene	SW8260B	G	-	-		20 - 24		U	20 - 23.5	7.70E+00	J	20 - 24	7.50E+01	J	20 - 22		U	16 - 18		U
Toluene	SW8260B	G	-	-		20 - 24		UZ	20 - 23.5		UJ	20 - 24	2.30E+00	J	20 - 22		UZ	16 - 18		UZ
Trichloroethene	SW8260B	G	-	-		20 - 24		UZ	20 - 23.5	8.00E+00	J	20 - 24	2.30E+01	J	20 - 22		UZ	16 - 18		UZ
Xylene, meta and/or para isomers	SW8260B	G	-	-		20 - 24		U	20 - 23.5		UJ	20 - 24		UJ	20 - 22		U	16 - 18		U
Data Validation Flags: none = Confirmed identification - the compound is considered to be present in the sample. U = The compound was analyzed for but was not detected. Values associated with "U" flagged results are not provided in this table. [Note: Sample quantitation limits are available in the OU 7-10 GEM Project VOC limitations and validation reports submitted to EPA and Idaho DEQ under separate cover.] J = The compound was positively identified in the sample, but the associated numerical value may not be an accurate representation of the amount actually present in the environmental sample. The data should be seriously considered for decision-making and are usable for many purposes. UJ = The compound was analyzed for but was not detected. The associated sample quantitation limit is an estimated quantity. Values associated with "UJ" flagged results are not provided in this table. [Note: Sample quantitation limits are available in the OU 7-10 GEM Project VOC limitations and validation reports submitted previously to EPA and Idaho DEQ under separate cover.] Z = The compound was positively identified in the sample, however the compound recovery was slightly outside acceptance limits. UZ = The compound was analyzed for but was not detected. The Z denotes compound recovery slightly outside of acceptance limits. UM = The compound was analyzed for but was not detected. The M denotes a modeled compound. " - " = No sample obtained at specified depth.																				
Other Compounds Analyzed For But Not Detected in Any Sample: Bromodichloromethane, Bromoform, Bromomethane, Carbon Disulfide, Chlorobenzene, Chlorodibromomethane, Chloroethane, Chloromethane, cis-1,3-Dichloropropene, Styrene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichlorofluoromethane, and Vinyl Chloride.																				

Table F-5. Cation-anion results for underburden core samples.

OU 7-10 Glovebox Excavator Method Project		Underburden Sample Cation and Anion Results by Core Location																									
		Underburden Core Location	P9-CORE-5B					P9-CORE-5A				P9-CORE-4				P9-CORE-3				P9-CORE-2				P9-CORE-1			
		Sample Series Number	P9GU4					P9GU3				P9GU6				P9GU5				P9GU2				P9GU1			
Compound	Analysis Method	Sample Segment ID	Sample Top - Bottom (in inches)	Analyte Conc.	Units	Data Validation Flag	Sample Top - Bottom (in inches)	Analyte Conc.	Units	Data Validation Flag	Sample Top - Bottom (in inches)	Analyte Conc.	Units	Data Validation Flag	Sample Top - Bottom (in inches)	Analyte Conc.	Units	Data Validation Flag	Sample Top - Bottom (in inches)	Analyte Conc.	Units	Data Validation Flag	Sample Top - Bottom (in inches)	Analyte Conc.	Units	Data Validation Flag	
Calcium	SW6010B	F	-	-	-		16 - 20	4.40E-02	MG LEACHED /G		16 - 20	3.80E-01	MG LEACHED /G		16 - 20	4.40E-01	MG LEACHED /G		16 - 20	1.20E-01	MG LEACHED /G		16 - 18	8.20E-02	MG LEACHED /G		
Chromium	SW6010B	F	-	-	-		16 - 20	1.50E-05	MG LEACHED /G		16 - 20	1.00E-05	MG LEACHED /G		16 - 20	5.00E-06	MG LEACHED /G		16 - 20	4.30E-06	MG LEACHED /G		16 - 18	6.00E-06	MG LEACHED /G		
Iron	SW6010B	F	-	-	-		16 - 20	2.80E-03	MG LEACHED /G		16 - 20			U	16 - 20	5.70E-03	MG LEACHED /G		16 - 20	4.60E-04	MG LEACHED /G		16 - 18			U	
Magnesium	SW6010B	F	-	-	-		16 - 20	1.60E-02	MG LEACHED /G		16 - 20	1.20E-01	MG LEACHED /G		16 - 20	1.50E-01	MG LEACHED /G		16 - 20	3.80E-02	MG LEACHED /G		16 - 18	3.10E-02	MG LEACHED /G		
Manganese	SW6010B	F	-	-	-		16 - 20	2.00E-05	MG LEACHED /G		16 - 20	2.00E-03	MG LEACHED /G		16 - 20	4.80E-05	MG LEACHED /G		16 - 20	5.00E-06	MG LEACHED /G		16 - 18	2.00E-06	MG LEACHED /G		
Potassium	SW6010B	F	-	-	-		16 - 20	1.20E-02	MG LEACHED /G		16 - 20	2.30E-02	MG LEACHED /G		16 - 20	2.40E-02	MG LEACHED /G		16 - 20	1.10E-02	MG LEACHED /G		16 - 18	8.30E-03	MG LEACHED /G		
Sodium	SW6010B	F	-	-	-		16 - 20	1.40E-01	MG LEACHED /G		16 - 20	1.20E-01	MG LEACHED /G		16 - 20	5.70E-01	MG LEACHED /G		16 - 20	5.50E-01	MG LEACHED /G		16 - 18	5.10E-01	MG LEACHED /G		
Strontium	SW6010B	F	-	-	-		16 - 20	2.50E-04	MG LEACHED /G		16 - 20	1.90E-03	MG LEACHED /G		16 - 20	2.30E-03	MG LEACHED /G		16 - 20	6.30E-04	MG LEACHED /G		16 - 18	4.70E-04	MG LEACHED /G		
Bromide	SW9056	F	-	-	-		16 - 20	1.10E-01	UG/G		16 - 20	1.10E-01	UG/G		16 - 20	1.10E-01	UG/G		16 - 20	1.10E-01	UG/G		16 - 18	1.10E-01	UG/G		
Chloride	SW9056	F	-	-	-		16 - 20	1.08E+02	UG/G		16 - 20	9.42E+02	UG/G		16 - 20	1.19E+03	UG/G		16 - 20	3.83E+02	UG/G		16 - 18	3.01E+02	UG/G		
Fluoride	SW9056	F	-	-	-		16 - 20	6.40E+00	UG/G		16 - 20	7.50E-01	UG/G		16 - 20	5.12E+00	UG/G		16 - 20	2.36E+00	UG/G		16 - 18	3.00E-02	UG/G		
Nitrate	SW9056	F	-	-	-		16 - 20	4.00E-01	UG N/G		16 - 20	3.26E+00	UG N/G		16 - 20	2.70E+02	UG N/G		16 - 20	2.31E+02	UG N/G		16 - 18	2.00E+02	UG N/G		
Nitrite	SW9056	F	-	-	-		16 - 20	2.10E-02	UG N/G		16 - 20	2.10E-02	UG N/G		16 - 20	3.90E-01	UG N/G		16 - 20	1.90E-01	UG N/G		16 - 18	2.70E-01	UG N/G		
Phosphate	SW9056	F	-	-	-		16 - 20	8.60E-01	UG P/G		16 - 20	4.30E-02	UG P/G		16 - 20	4.30E-02	UG P/G		16 - 20	4.70E-01	UG P/G		16 - 18	4.30E-02	UG P/G		
Sulfate	SW9056	F	-	-	-		16 - 20	1.51E+01	UG/G	J	16 - 20	1.83E+01	UG/G	J	16 - 20	3.06E+01	UG/G	J	16 - 20	2.13E+01	UG/G	J	16 - 18	2.62E+01	UG/G	J	
<div>Data Validation Flags: none = Confirmed identification - the material is considered to be present in the sample. U = The material was analyzed for and was detected at or above the applicable detection limit. However, the associated value was less than 5 times the highest positive amount in any laboratory blank. Values associated with "U" flagged results are not provided in this table. [Note: All sample values are available in the OU 7-10 GEM Project VOC limitations and validation reports previously submitted to EPA and Idaho DEQ under separate cover.] J = The material was analyzed for and was detected at or above the applicable detection limit. The associated value is an estimate and may be inaccurate or imprecise. UJ = The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. Values associated with "UJ" flagged results are not provided in this table. [Note: All sample values are available in the OU 7-10 GEM Project VOC limitations and validation reports submitted previously to EPA and Idaho DEQ under separate cover.] " - " = No sample obtained at specified depth.</div>																											





Appendix G

Summary of Pit 9 Origins for Retrieved Waste

Appendix G

Summary of Pit 9 Origins for Retrieved Waste

Table G-1 identifies the scoop (or cart) number and associated reach, angle, and depth measurements for each waste drum packaged during OU 7-10 Glovebox Excavator Method Project operations. Generally, only one or two scoops are associated with a soil or sludge drum. Debris drums, in comparison, generally have three or more scoops.

Table G-1. Scoop (or cart) number and associated reach, angle, and depth measurements for each waste drum packaged during OU 7-10 Glovebox Excavator Method Project operations.

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030001	1170	8.33	70	14.03
	1172	6.98	40	13.85
	1174	9.36	50	13.46
GEM030002	1155	9.43	30	13.81
	1156	7.93	40	14.52
GEM030006	2119	8.31	60	13.52
	2120	8.42	60	14.08
GEM030007	2163	12.18	110	9.14
	2164	12.36	110	9.45
GEM030011	1207	7.67	60	15.74
	1208	6.71	60	15.55
GEM030012	1221	7.83	110	9.2
	1222	8.95	110	9.31
GEM030015	3142	13.46	90	10.24
	3143	11.66	90	11.18
GEM030016	2124	8.41	50	14.13
	2125	8.47	70	14.22
	2126	6.99	60	13.96
GEM030017	1164	7.64	70	13.87
	1165	7.06	70	12.71
GEM030018	1158	8.33	70	13.24
	1161	9.24	50	13.92
GEM030028	3132	6.79	60	15.38
	3133	9.14	110	9.35
GEM030032	2105	7.03	70	11.53
	2106	7.03	70	11.53
	2107	6.37	50	12.16
	2108	10.47	40	13.7

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030033	2213	9.98	90	11.84
	2216	5.74	90	11.96
	2217	9.47	110	13.91
	2218	9.02	100	14.03
GEM030034	2166	9.4	100	9.49
	2167	6.51	100	9.26
	2169	7.16	100	9.9
	2170	4.72	90	9.72
	2174	5.67	60	13.39
	2175	4.9	70	12.71
	2181	5.88	70	13.27
	2183	7.78	70	12.53
	2184	10.34	80	10.7
	2186	11.55	90	10.58
GEM030035	2127	8.85	40	15.03
	2128	10.28	70	9.25
	2129	8.53	60	14.23
	2130	8.89	40	14.81
	2131	7.5	50	14.09
	2132	8.26	50	14.48
	2133	8.19	40	14.7
	2134	6.11	40	14.21
	2135	6.23	70	13.95
	2137	7.17	70	13.41
GEM030040	2066	2.19	60	8.73
	2067	7.22	20	8.74
	2068	2.32	60	9.33
	2068	2.32	60	9.33
	2069	9.3	40	9.3
	2069	9.3	40	9.3
	2070	4.04	50	8.47
GEM030041	2005	11.93	40	8.59
	2008	8.62	20	6.52
	2029	8.66	60	9.51
	2030	6.46	60	9.58
	2036	3.75	60	9.4
	2037	3.69	40	8.9
	2039	9.64	20	9.26
	2048	9.98	30	10.18
	2057	9.99	40	9.87
	2058	9.31	40	10.75
	2059	8.85	40	11.12

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
	2060	6.13	60	10.85
	2062	8.2	40	10.4
	2065	4.27	60	9.29
GEM030042	2096	5.96	40	12.33
	2097	5.79	40	11.97
	2099	7.69	50	12.79
	2100	7.63	40	13.56
	2101	9.41	60	11.92
	2102	5.36	50	11.41
	2103	3.56	40	10.62
GEM030047	2072	6.27	50	8.14
	2073	5.72	40	10.04
	2074	6.27	50	8.14
	2075	4.22	40	9.92
	2076	11.35	50	11.65
	2077	4.44	70	9.62
	2078	11.39	50	11.7
	2079	10.23	40	11.98
	2080 ^a	9.78	40	11.25
	2080 ^a	8.7	60	11.02
	2080 ^a	8.1	60	10.76
GEM030048	2195	8.83	90	13.78
	2196	7.15	90	13.47
	2198	6.09	90	12.72
	2199	6.48	50	13.51
GEM030049	2206	6.18	80	12.98
	2207	6.81	110	12.72
	2210	7.63	90	13.92
	2211	7.18	90	14.09
	2212	9.98	90	11.84
	2213	9.98	90	11.84
GEM030050	2226	8.35	100	10.56
	2227	7.25	110	14.79
	2228	8.69	100	15.42
GEM030051	1179	8.51	40	15.03
	1180	6.22	70	13.9
GEM030052	1187	6.57	50	14
	1188	6.76	40	14.51
GEM030053	1067	3.78	70	9
	1069	9.09	30	9.19
GEM030054	3110	5.44	40	14.83
	3111	4.55	60	13.29

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030055	2063	6.7	40	10.38
	2064	2.95	50	9.09
GEM030056	2073	5.72	40	10.04
	2074	6.27	50	8.14
GEM030057	2057	9.99	40	9.87
	2058	9.31	40	10.75
GEM030058	1291	8.95	140	9.04
	1292	10.07	90	15.25
GEM030059	2087	6.04	40	11.04
	2088	7.49	50	11.54
GEM030060	2023	9.75	50	8.75
	2024	7.58	60	8.66
GEM030061	1171	7.4	70	14.39
	1173	7.01	70	14.27
GEM030062	3160	8.57	100	13.65
	3161	8.61	90	13.61
	3162	7.9	90	13.6
GEM030063	3173	10.06	110	14.01
	3174	8.5	110	14.38
GEM030064	1088	3.73	70	10.05
	1089	3.66	40	8.74
GEM030065	1269	4.68	110	12.29
	1270	8.27	110	14.26
GEM030066	1279	9.11	110	14.37
	1280	9.76	100	13.92
GEM030067	2209	10.14	100	13.43
	2210	7.63	90	13.92
GEM030068	3189	7.38	140	8.55
	3190	7	80	14.06
GEM030069	1275	5.16	100	13.02
	1277	10.02	90	14.16
GEM030070	1249	6.86	100	12.81
	1250	8.58	80	14.18
GEM030071	2232	9.72	90	14.82
	2233	10.83	90	14.88
GEM030072	1242	7.27	100	10.64
	1243	6.52	100	11.22
	1244	6.93	70	13.16
	1245	5.88	70	13.27
	1246	7.12	80	13.06
	1247	6.42	90	12.86

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030073	1282	9.55	110	14.62
	1284	8.89	110	14.31
GEM030074	3181	8.2	80	14.49
	3182	7.77	70	14.25
GEM030075	1287	6.1	70	14.01
	1288	4.93	100	13.48
GEM030076	3197	13.04	130	9.57
	3199	13.06	140	9.16
GEM030077	1271	2	110	9.72
	1272	6.53	110	12.45
GEM030078	1247	6.42	90	12.86
	1248	4.63	90	11.79
GEM030079	3147	5.87	60	13.68
	3148	5.28	80	13.06
GEM030080	1217	9.69	100	9.48
	1218	9.98	110	9.11
GEM030081	3151	9.98	90	11.84
	3152	9.98	90	11.84
GEM030082	3144	11.18	90	10.34
	3145	3.19	70	11.36
GEM030083	1236	5.9	60	13.8
	1238	8.73	70	13.45
	1239	7.72	70	14.21
GEM030084	3083	4.89	40	11.31
	3084	10.47	40	13.7
GEM030085	1235	6.91	90	10.42
	1236	5.9	60	13.8
GEM030086	1251	8.29	90	13.99
	1252	6.6	80	13.66
	1253	2.45	50	12.41
	1254	6.37	70	13.86
	1255	4.81	70	13.48
	1257	4.85	70	13.31
	1258	8.55	110	13.52
GEM030087	3157	7.17	80	13.9
	3158	6.73	80	13.92
GEM030088	1265	5.78	110	13.35
	1266	6.26	110	13.82
GEM030089	1231	3.98	80	11.19
	1232	3.22	60	11.4
GEM030090	3140	7.58	100	10.13
	3141	8.57	100	10.52

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030091	2202	6.88	110	12.38
	2203	5.08	110	12.67
GEM030092	3146	8.25	70	12.74
GEM030093	2175	4.9	70	12.71
	2176	7.82	100	11.28
GEM030094	1241	7.63	80	13.07
GEM030095	2171	2.85	70	10.81
	2172	4.3	80	10.96
GEM030096	3163	4.74	70	13.74
	3164	6.09	70	14.08
GEM030097	1229	6.57	100	10.18
	1230	5.99	110	9.48
GEM030098	1299	6.65	80	13.81
	1300	8.33	80	14.99
GEM030099	1215	12.55	110	9.57
	1216	10.97	110	9.38
GEM030100	2167	6.51	100	9.26
	2168	8.34	100	9.61
GEM030114	3134	12.45	100	9.54
	3135	9.34	100	9.09
GEM030115	3136	9.99	100	9.27
	3137	6.97	110	9.21
GEM030116	3130	6.02	60	15.04
	3131	5.74	60	14.67
GEM030117	1211	15.07	110	8.82
	1212	13.59	110	9.41
GEM030146	2151	7.47	70	13.7
	2152	7.48	70	13.95
GEM030147	3106	7.13	50	14.3
	3107	6.1	40	14.38
	3108	7.37	40	15.13
	3110	5.44	40	14.83
	3111	4.55	60	13.29
	3112	9.14	50	15.5
	3113	9.42	60	15.47
	3114	9.85	60	15.15
	3115	8.95	70	15.02
	3116	10.05	70	15.31
	3117	9.84	70	15.49
	3118	9.36	60	16
	3119	10.28	60	15.93
	3120	10.81	70	16

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
	3121	10.07	60	16
	3123	8.99	70	14.89
	3126	6.51	50	15.68
	3127	9.32	60	16.01
	3128	7.65	60	15.64
	3129	7	60	15.83
	3130	6.02	60	15.04
	3131	5.74	60	14.67
	3132	6.79	60	15.38
	3133	9.14	110	9.35
GEM030148	2121	8.73	60	14.5
	2122	8.67	50	14.69
GEM030149	1213	12.89	110	9.24
	1214	12.56	110	9.38
GEM030150	1162	6.84	30	13.33
	1163	7.61	70	13.23
GEM030151	1136	6.34	40	11.65
	1137	6.09	60	11.48
GEM030152	1241	7.63	80	13.07
	1242	7.27	100	10.64
GEM030153	2165	9.81	110	9.18
	2166	9.4	100	9.49
GEM030156	3222	9.37	140	9.78
	3224	7.24	120	14.54
GEM030157	3216	8.83	100	15.2
	3218	8.49	110	15.74
GEM030158	1116	8.2	20	10.06
	1117	4.46	40	9.45
GEM030159	1132	9.44	35	12.82
	1133	11.02	40	13.02
GEM030160	3079	5.12	40	11.23
	3080	6.49	40	12.1
GEM030161	1134	6.21	60	11.84
	1135	6.19	40	11.23
GEM030162	1120	8.64	50	11.47
	1121	6.93	60	11.08
GEM030163	3069	7.41	60	11.87
	3070	6.14	60	11.06
GEM030166	2101	9.41	60	11.92
	2102	5.36	50	11.41
GEM030167	3081	8.19	40	13.6
	3082	4.71	60	10.81

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030168	1128	10.59	60	11.74
	1129	8.76	70	11.87
GEM030171	2093	7.43	70	12.02
	2094	10.23	30	12.58
GEM030172	3084	10.47	40	13.7
	3085	6.2	50	13.21
	3086	8.44	30	14.04
	3087	6.83	40	13.35
GEM030175	3057	11.63	40	10.4
	3058	11.8	50	10.43
GEM030176	2001	12.06	20	4.97
	2002	13.65	30	8.04
GEM030177	2059	8.85	40	11.12
	2060	6.13	60	10.85
GEM030178	1124	6.71	50	12.23
	1125	6.97	40	11.7
GEM030179	1311	7.64	100	14.38
	1312	6.36	70	13.76
GEM030180	1142	7.96	40	12.74
	1143	4.97	50	11.35
GEM030181	3219	5.45	100	15.26
	3220	8.17	110	15.35
GEM030182	3205	5.69	90	13.2
	3206	6.24	80	14.24
GEM030183	1325	10.26	110	12.96
	1326	5.62	80	14.46
GEM030198	2157	7.57	50	15.91
	2158	12.95	90	9.02
GEM030199	2169	7.16	100	9.9
	2170	4.72	90	9.72
GEM030200	2159	13.1	90	9.29
	2160	13.61	90	9.16
GEM030201	1227	11.53	90	10.53
	1228	10.4	100	10.67
GEM030202	2229	13.61	100	12.53
	2230	9.63	90	12.79
	2231	8.64	140	8.46
GEM030203	3179	9.41	100	14.78
	3180	9.49	100	14.77
GEM030204	1219	8.14	100	9.32
	1220	8.96	110	9.23

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030205	1207	7.67	60	15.74
	1208	6.71	60	15.55
	1220	8.96	110	9.23
	1221	7.83	110	9.2
	1222	8.95	110	9.31
	1223	8.31	100	10.34
GEM030206	2195	8.83	90	13.78
	2196	7.15	90	13.47
GEM030207	1223	8.31	100	10.34
	1224	13.15	90	10.1
GEM030208	1098	9.75	50	4.46
	1099	4.49	50	10.33
GEM030209	2187	6.83	80	12.83
	2188	8.62	70	13.61
GEM030210	1229	6.57	100	10.18
	1230	5.99	110	9.48
	1231	3.98	80	11.19
	1232	3.22	60	11.4
	1233	8.1	90	10.89
	1234	6.94	100	10.39
	1235	6.91	90	10.42
GEM030211	2191	6.98	80	13.89
	2192	7.48	70	14.48
GEM030212	1248	4.63	90	11.79
	1249	6.86	100	12.81
	1250	8.58	80	14.18
GEM030213	3169	2.8	90	11.86
	3170	6.74	110	13.29
GEM030214	2179	10.53	100	12.29
	2180	4.62	110	9.45
GEM030215	1233	8.1	90	10.89
	1234	6.94	100	10.39
GEM030216	3067	7.78	40	12.13
	3068	8.52	30	10
GEM030217	3137	6.97	110	9.21
	3139	8.48	100	10.09
	3141	8.57	100	10.52
	3147	5.87	60	13.68
	3148	5.28	80	13.06
	3152	9.98	90	11.84

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
	3153	8.45	70	11.96
	3154	8.01	70	13.14
	3155	6.91	70	12.5
GEM030218	3045	4.46	60	8.8
	3046	9.76	70	9.28
GEM030219	2031	2.79	50	8.41
	2032	8.13	70	9.48
GEM030220	3039	13.52	60	9.46
	3040	12.14	60	9.5
GEM030221	2089	7.5	50	12.02
	2090	7.42	60	12.24
	2091	6.54	50	12.03
	2092	6.56	60	11.66
	2093	7.43	70	12.02
	2094	10.23	30	12.58
GEM030222	3055	3.92	40	9.13
	3056	10.93	10	9.58
GEM030223	1074	12.09	30	10.2
	1075	9.42	30	10.21
GEM030224	1259	5.59	70	13.63
	1260	4.68	90	12.46
GEM030225	1261	4.68	90	12.46
	1262	7.32	90	13.4
GEM030226	3168	7.95	90	13.88
	3171	8.6	110	13.72
	3179	9.41	100	14.78
	3181	8.2	80	14.49
	3183	8.21	80	14.38
	3184	8.38	80	14.37
	3185	6.93	70	14.21
	3188	5.61	100	13.34
GEM030227	1263	8.47	110	13.59
	1264	7.07	90	13.7
GEM030228	2051	3.77	70	10.1
	2052	3.46	50	8.79
GEM030229	2027	5.22	50	8.15
	2028	11.34	60	9.5
GEM030230	3042	7.96	60	9.49
	3044	3.3	50	8.33
GEM030231	NA	NA	NA	NA
GEM030232	2039	9.64	20	9.26
	2040	11.95	30	10.18

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030233	3187	13.41	140	8.53
	3188	5.61	100	13.34
GEM030234	1285	7.7	100	14.89
	1286	8.77	110	14.84
GEM030235	1145	8.52	70	12.48
	1146	7.28	70	12.15
GEM030236	2029	8.66	60	9.51
	2030	6.46	60	9.58
GEM030237	1048	3.64	70	7.87
	1049	5.8	40	8.58
GEM030238	1293	10.92	110	15.16
	1294	11.05	90	14.6
GEM030239	1305	11.76	140	9.95
	1306	10.74	140	9.96
GEM030240	3075	5.91	60	10.76
	3076	6.5	40	12.01
GEM030241	3089	8.14	50	13.57
	3090	7.62	50	13.55
GEM030242	2095	8.68	20	12.1
	2096	5.96	40	12.33
GEM030243	2097	5.79	40	11.97
	2098	9.74	70	13.01
GEM030244	1110	7.63	50	8.62
	1112	8.66	30	10.06
GEM030245	3085	6.2	50	13.21
	3086	8.44	30	14.04
GEM030246	3167	10.96	110	14.96
	3168	7.95	90	13.88
GEM030247	1267	5.78	100	14.01
	1268	3.33	110	11.65
GEM030248	1052	6.55	50	8.86
	1053	5.79	50	9.11
GEM030249	1058	11.1	70	9.43
	1059	3.79	50	8.75
GEM030250	3037	5.61	60	8.68
	3038	7.25	50	9.53
GEM030251	1090	6	40	10.1
	1091	10.63	70	10.46
GEM030252	2224	9.31	100	14.91
	2225	8.64	110	14.51
GEM030253	1056	4.71	60	8.67
	1057	5.94	60	9.19

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030254	2041	11.45	30	10.31
	2042	10.93	50	10.12
GEM030255	1054	5.86	60	9.07
	1055	5.21	60	9.04
GEM030256	1062	9.47	50	9.47
	1063	6.82	50	9.38
GEM030257	1169	7.22	50	14.19
	1170	8.33	70	14.03
	1171	7.4	70	14.39
	1172	6.98	40	13.85
	1173	7.01	70	14.27
	1174	9.36	50	13.46
GEM030258	2109	6.82	50	12.69
	2110	7.87	50	13.23
GEM030259	1144	7.49	50	12.59
	1147	8.6	40	13.3
GEM030260	1255	4.81	70	13.48
	1257	4.85	70	13.31
GEM030261	1251	8.29	90	13.99
	1252	6.6	80	13.66
GEM030262	1085	6	70	10.66
	1086	3.73	70	9.35
GEM030263	1256	6.52	80	13.36
	1258	8.55	110	13.52
GEM030264	2197	8.21	90	14.15
	2198	6.09	90	12.72
GEM030265	3183	8.21	80	14.38
	3184	8.38	80	14.37
GEM030266	1303	13.07	140	9.67
	1304	12.89	140	9.78
GEM030267	1281	9.42	110	14.79
	1283	9.75	100	14.85
GEM030268	2236	11.04	80	14.67
	2237	12.12	140	9.3
GEM030269	2234	12.51	100	14.23
	2235	10.07	90	14.74
GEM030270	2211	7.18	90	14.09
	2213	9.98	90	11.84
GEM030271	2200	7.15	90	13.54
	2201	4.11	70	12.95
GEM030272	2055	6.28	50	9.73
	2056	5.22	50	9.29

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030273	2200	7.15	90	13.54
	2201	4.11	70	12.95
	2203	5.08	110	12.67
	2204	5	110	11.63
GEM030275	2191	6.98	80	13.89
	2192	7.48	70	14.48
	2193	7.07	100	14.94
	2194	5.37	80	12.23
GEM030276	2131	7.5	50	14.09
	2132	8.26	50	14.48
	2133	8.19	40	14.7
GEM030277	2181	5.88	70	13.27
	2182	8.53	70	11.7
	2183	7.78	70	12.53
GEM030280	2138	4.59	60	12.94
	2139	4.5	60	12.07
	2140	6.58	50	14.59
	2141	9.63	50	15.5
	2142	9.23	60	15.49
	2143	9.56	60	14.27
	2144	9.7	50	15.49
	2145	9.12	60	15.45
	2146	10.47	60	15.5
	2147	8.37	60	15.5
	2148	9.08	40	15.85
	2151	7.47	70	13.7
	2152	7.48	70	13.95
	2153	8.06	50	15.89
	2154	9.57	70	15.85
	2155	10.29	70	15.73
	2156	8.23	70	15.79
	2165	9.81	110	9.18
GEM030281	1076	12.76	40	10.48
	1080	5.83	60	9.66
GEM030282	3065	6.95	40	11.28
	3066	8.34	40	11.43
GEM030283	3031	7.4	50	8.81
	3032	7.73	50	8.36
GEM030284	3021	8.25	40	8.16
	3024	10.04	20	9.13
GEM030285	2005	11.93	40	8.59
	2006	10.16	40	8.44

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030286	1012	8.45	30	7.91
	1013	9.48	40	7.93
GEM030287	3022	7.17	40	5.42
	3023	9.02	40	8.88
GEM030288	1159	7.86	70	13.14
	1160	7.59	60	13.18
GEM030289	1009	12.28	10	8.32
	1010	11.32	10	8.02
GEM030290	1015	12.68	20	8.29
	1016	11.48	20	8.89
GEM030291	1024	8.56	30	8.6
	1025	8.14	30	7.87
GEM030292	3077	6.71	50	11.83
	3078	7.67	50	12.34
GEM030293	3073	9.39	70	11.86
	3074	10.28	20	12.61
GEM030294	3071	10.36	70	11.81
	3072	9.94	60	12.47
GEM030295	2081	6.85	50	11.02
	2082	6.31	60	10.83
GEM030296	1040	9.52	30	6.55
	1041	9.52	30	6.55
GEM030297	3011	11.8	30	7.27
	3012	8.28	30	8.97
GEM030298	3007	8.89	60	7.44
	3008	8.01	50	7.44
GEM030299	2011	7.11	50	8.04
	2012	4.54	60	7.8
GEM030300	1130	5.67	40	10.81
	1131	10.86	30	12.52
GEM030351	3063	6.97	60	10.93
	3065	6.95	40	11.28
	3067	7.78	40	12.13
	3069	7.41	60	11.87
	3071	10.36	70	11.81
	3072	9.94	60	12.47
	3073	9.39	70	11.86
	3074	10.28	20	12.61
	3075	5.91	60	10.76
	3076	6.5	40	12.01
	3077	6.71	50	11.83

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030352	2115	5.96	70	12.82
	2116	4.1	50	12.17
GEM030353	1164	7.64	70	13.87
	1165	7.06	70	12.71
	1166	7.78	40	14.17
	1167	7.99	40	14.58
	1168	6.38	70	14
GEM030354	2127	8.85	40	15.03
	2128	10.28	70	9.25
GEM030355	2129	8.53	60	14.23
	2130	8.89	40	14.81
GEM030356	3088	5	50	12.83
	3089	8.14	50	13.57
	3094	11.46	70	9.5
	3096	10.24	70	15.04
	3097	8.93	60	15.1
	3098	9.35	70	14.55
	3099	9.72	60	14.62
	3100	5.85	40	13.35
GEM030363	2099	7.69	50	12.79
	2100	7.63	40	13.56
GEM030364	2255	5.21	70	13.92
	2256	7.02	110	13.42
	2257	5.83	110	14.13
GEM030365	1329	5.69	80	14.5
	1330	5.71	80	14.72
	1332	5.23	90	14.5
	1333	6.71	110	14.11
	1335	8.47	110	15.4
	1338	9.19	90	14.99
	1339	8.14	110	16
	1340	9.89	110	13.54
GEM030368	1152	4.37	50	11.5
	1153	6.67	60	12.14
	1154	8.07	50	13.89
	1155	9.43	30	13.81
	1156	7.93	40	14.52
	1157	8.07	60	13.46
GEM030369	1150	5.39	50	11.1
	1151	2.99	60	9.18
GEM030379	3211	5.43	90	13.48
	3212	4.93	70	14.27

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030388	1329	5.69	80	14.5
	1330	5.71	80	14.72
GEM030389	3185	6.93	70	14.21
	3186	10.35	80	14.68
GEM030390	1289	5.35	90	13.77
	1290	8.53	140	8.54
GEM030391	1313	6.37	70	14.17
	1314	7.8	80	14.81
GEM030396	1337	7.89	100	15.39
	1338	9.19	90	14.99
GEM030397	2238	9.75	140	9.49
	2239	7.99	90	14.69
GEM030398	1309	9.69	110	14
	1310	7.9	100	14.47
GEM030399	2240	7.68	110	13.98
	2241	8.15	110	14
GEM030402	2250	6.53	90	13.91
	2251	12.79	130	9.05
GEM030404	1327	6.64	80	14.28
	1328	6.15	80	14.24
GEM030406	1099	4.49	50	10.33
	1110	7.63	50	8.62
	1112	8.66	30	10.06
	1113	8.31	40	11.2
	1114	4.8	40	9.51
	1115	4.77	50	10
	1116	8.2	20	10.06
	1117	4.46	40	9.45
	1118	9.23	50	12
	1121	6.93	60	11.08
	1122	6.5	60	11.07
	1123	10.28	30	11.12
	1124	6.71	50	12.23
	1125	6.97	40	11.7
	1127	10.18	60	11.47
	1129	8.76	70	11.87
	1132	9.44	35	12.82
	1133	11.02	40	13.02
	1134	6.21	60	11.84
	1135	6.19	40	11.23
GEM030411	1339	8.14	110	16
	1340	9.89	110	13.54

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030418	2089	7.5	50	12.02
	2090	7.42	60	12.24
GEM030419	2103	3.56	40	10.62
	2104	2.83	60	10.28
GEM030420	2075	4.22	40	9.92
	2076	11.35	50	11.65
GEM030421	3153	8.45	70	11.96
	3154	8.01	70	13.14
GEM030422	2177	4.75	80	12.62
	2178	9.91	100	12.51
GEM030427	3126	6.51	50	15.68
	3127	9.32	60	16.01
GEM030428	3155	6.91	70	12.5
	3156	4.46	90	11.58
GEM030429	3122	7.49	60	15.71
	3123	8.99	70	14.89
GEM030434	2003	7.89	50	8.6
	2004	10.36	30	8.53
GEM030435	1118	9.23	50	12
	1119	4.78	40	10.02
GEM030436	2254	6.82	110	13.86
	2255	5.21	70	13.92
GEM030437	1321	9.43	100	14.49
	1322	8.88	110	13.15
GEM030438	2252	7.32	110	10.83
	2253	7.32	110	10.83
GEM030443	1319	5.31	90	14.41
	1320	8.48	110	13.81
GEM030444	3138	8.29	100	9.64
	3139	8.48	100	10.09
GEM030445	2173	9.08	70	11.78
	2174	5.67	60	13.39
GEM030446	2067	7.22	20	8.74
	2071	8.32	30	9.4
GEM030447	1239	7.72	70	14.21
	1240	11.62	70	13.73
GEM030448	1154	8.07	50	13.89
	1157	8.07	60	13.46
GEM030449	3001	8.46	50	8.11
	3002	10.26	30	7.16
GEM030450	2111	7.99	50	13.46
	2112	6.68	60	12.68

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030451	1005	12.33	10	8.61
	1006	5.46	15	5.95
GEM030452	2015	8.68	30	8.83
	2016	9.4	30	7.59
GEM030453	1140	7.33	40	12.17
	1141	7.58	30	12.07
GEM030454	1152	4.37	50	11.5
	1153	6.67	60	12.14
GEM030455	2053	5.88	50	9.1
	2054	4.91	40	10
GEM030456	3097	8.93	60	15.1
	3099	9.72	60	14.62
GEM030457	3106	7.13	50	14.3
	3107	6.1	40	14.38
GEM030458	1175	8.96	60	14.61
	1176	8.84	40	14.79
GEM030459	2139	4.5	60	12.07
	2140	6.58	50	14.59
GEM030460	2141	9.63	50	15.5
	2142	9.23	60	15.49
GEM030461	2143	9.56	60	14.27
	2144	9.7	50	15.49
GEM030462	1199	9.5	50	15.94
	1200	9.95	60	15.94
GEM030463	1185	6.53	70	13.71
	1186	5.32	60	13.46
	1187	6.57	50	14
	1188	6.76	40	14.51
	1189	4.62	60	13.92
	1190	9.06	40	15.63
	1191	9.92	50	15.5
	1192	7.79	50	15.28
	1193	7.88	50	15.37
	1194	5.8	40	14.75
	1195	9.72	50	15.35
	1196	9.43	70	15.17
	1197	9.46	70	15.39
	1198	8.7	70	15.45
	1199	9.5	50	15.94
	1200	9.95	60	15.94
	1201	10.24	70	15.96

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
	1202	8.65	50	15.12
	1203	7.86	50	15.74
	1204	6.64	50	13.92
	1205	7.76	60	15.54
	1206	7.48	50	15.88
GEM030464	3112	9.14	50	15.5
	3113	9.42	60	15.47
GEM030465	2147	8.37	60	15.5
	2148	9.08	40	15.85
GEM030466	1185	6.53	70	13.71
	1186	5.32	60	13.46
GEM030467	2045	6.08	50	9.52
	2046	5.81	50	9.76
GEM030468	3101	8.3	40	15.07
	3102	9.32	70	14.15
GEM030469	3028	5.07	70	8.04
	3030	13	50	9.42
GEM030470	1034	6.55	40	8.43
	1035	5.68	40	8.38
GEM030471	1060	4.31	50	8.38
	1061	3.54	50	8.35
GEM030472	1177	8.09	50	14.68
	1178	8.12	50	14.23
GEM030473	1167	7.99	40	14.58
	1168	6.38	70	14
GEM030474	2145	9.12	60	15.45
	2146	10.47	60	15.5
GEM030475	1195	9.72	50	15.35
	1196	9.43	70	15.17
GEM030476	3114	9.85	60	15.15
	3115	8.95	70	15.02
GEM030477	3118	9.36	60	16
	3119	10.28	60	15.93
GEM030478	1191	9.92	50	15.5
	1192	7.79	50	15.28
GEM030479	2135	6.23	70	13.95
	2136	5.06	60	13.62
GEM030480	2078	11.39	50	11.7
	2079	10.23	40	11.98
GEM030481	2083	8.5	40	11.82
	2084	5.28	40	10.69

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030482	1111	9.5	30	9.73
	1113	8.31	40	11.2
GEM030483	3087	6.83	40	13.35
	3088	5	50	12.83
GEM030484	1201	10.24	70	15.96
	1202	8.65	50	15.12
GEM030485	1183	7.48	80	13.62
	1184	5.51	70	13.16
GEM030486	2117	7.18	70	13.12
	2118	8.52	30	14.19
GEM030487	3078	7.67	50	12.34
	3079	5.12	40	11.23
	3080	6.49	40	12.1
	3081	8.19	40	13.6
GEM030488	1193	7.88	50	15.37
	1194	5.8	40	14.75
GEM030489	2149	10.05	40	15.95
	2150	7.11	50	15.36
GEM030490	3102	9.32	70	14.15
	3103	10.14	40	15.07
	3104	5.85	60	13.93
	3105	5.69	50	13.7
GEM030491	3116	10.05	70	15.31
	3117	9.84	70	15.49
GEM030492	1181	8.08	50	14.45
	1182	8.44	60	14.11
GEM030493	1104	8.19	70	11.23
	1105	5.74	70	10.09
GEM030494	2085	8.23	40	11.4
	2086	8	50	11.63
GEM030495	1175	8.96	60	14.61
	1176	8.84	40	14.79
	1177	8.09	50	14.68
	1178	8.12	50	14.23
	1179	8.51	40	15.03
	1180	6.22	70	13.9
	1181	8.08	50	14.45
	1182	8.44	60	14.11
GEM030496	1003	8.7	10	6.98
	1004	9.87	10	7.86
GEM030497	1225	13.34	80	10.81
	1226	9.04	100	10.48

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030498	1237	6.01	80	12.84
	1238	8.73	70	13.45
GEM030499	1001	12.87	10	8.7
	1002	11.24	10	7.41
GEM030500	3149	3.36	80	12.09
	3150	5.22	80	13.03
GEM030501	3128	7.65	60	15.64
	3129	7	60	15.83
GEM030502	3104	5.85	60	13.93
	3105	5.69	50	13.7
GEM030503	3108	7.37	40	15.13
	3109	6.22	50	14.2
GEM030504	2124	8.41	50	14.13
GEM030505	3094	11.46	70	9.5
	3096	10.24	70	15.04
GEM030506	1066	4.85	70	9.11
	1068	5.29	40	9.15
GEM030507	1084	9.9	70	9.71
	1087	4.19	70	9.73
GEM030508	1148	7.45	40	13.05
	1149	7.7	70	12.54
GEM030509	1017	10.47	10	7.99
	1019	12.69	20	8.46
GEM030510	2049	4.56	40	5.15
	2050	5.44	70	10.02
GEM030511	2021	5.87	40	8.48
	2022	8.75	30	9.27
GEM030512	1050	3.91	40	7.43
	1051	12.83	50	9.55
GEM030513	3015	8.3	30	4.88
	3016	8.61	40	9.75
GEM030514	1007	7.17	70	7.18
	1008	4.15	60	7.57
GEM030515	3041	8.89	60	9.39
	3043	3.84	50	8.76
GEM030516	3017	1.49	70	6.74
	3018	6.12	10	8.14
GEM030517	1018	10.44	20	7.55
	1020	11.35	20	8.37
GEM030518	1046	9.46	50	8.36
	1047	6.73	60	8.26

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030519	2035	5.55	40	9.04
	2036	3.75	60	9.4
GEM030520	2037	3.69	40	8.9
	2038	4.06	70	9.61
GEM030521	3013	8.27	40	9.04
	3014	6.08	40	8.24
GEM030522	3009	7.1	40	8.25
	3010	8.81	20	9.03
GEM030523	2161	11.74	90	9.2
	2162	14.2	110	9
GEM030524	1203	7.86	50	15.74
	1204	6.64	50	13.92
GEM030525	3209	6.74	80	14.7
	3210	5.69	80	13.73
GEM030526	3192	8.86	90	14.81
	3193	8	110	14.12
	3194	6.62	80	13.99
	3203	5.6	80	13.71
	3204	6.66	80	14.54
	3205	5.69	90	13.2
	3207	5.28	80	14.5
	3208	6.42	90	13.96
	3209	6.74	80	14.7
GEM030527	1317	5.44	70	13.81
	1318	4.02	70	13.07
GEM030528	2256	7.02	110	13.42
	2257	5.83	110	14.13
GEM030529	2153	8.06	50	15.89
	2154	9.57	70	15.85
GEM030530	1205	7.76	60	15.54
	1206	7.48	50	15.88
GEM030531	1307	6.02	80	13.57
	1312	6.36	70	13.76
	1313	6.37	70	14.17
	1315	5.4	80	14.12
	1317	5.44	70	13.81
	1322	8.88	110	13.15
	1323	7.32	110	10.83
	1325	10.26	110	12.96
	1326	5.62	80	14.46
	1327	6.64	80	14.28
	1328	6.15	80	14.24

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030532	3207	5.28	80	14.5
	3208	6.42	90	13.96
GEM030533	1333	6.71	110	14.11
	1334	6.91	110	14.52
GEM030534	3218	8.49	110	15.74
	3220	8.17	110	15.35
	3224	7.24	120	14.54
GEM030535	1028	8.92	20	8.3
	1029	8.22	20	8.28
GEM030536	1038	10.02	40	9.63
	1039	5.69	10	8.02
GEM030537	2019	1.36	70	7.01
	2020	3.59	10	7.6
GEM030538	3033	6.51	50	8.7
	3034	6.1	50	8.81
GEM030539	1078	9.64	50	10.07
	1079	5.38	60	9.23
GEM030540	1335	8.47	110	15.4
	1336	8.65	100	15.3
GEM030542	1323	7.32	110	10.83
	1324	10.26	110	12.96
GEM030543	1315	5.4	80	14.12
	1316	6.33	80	14.78
GEM030544	2043	10.01	50	10.27
	2044	7.54	50	9.56
GEM030545	2047	6.68	60	9.87
	2048	9.98	30	10.18
GEM030546	3049	6.5	40	8.75
	3050	6.79	10	9.34
GEM030547	1197	9.46	70	15.39
	1198	8.7	70	15.45
GEM030548	2134	6.11	40	14.21
GEM030549	3120	10.81	70	16
	3121	10.07	60	16
GEM030550	1189	4.62	60	13.92
	1190	9.06	40	15.63
GEM030551	1166	7.78	40	14.17
	1169	7.22	50	14.19
GEM030552	3053	4.56	60	9.27
	3054	3.88	70	9.5
GEM030553	3051	4.28	60	7.68
	3052	4.05	60	9.04

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030554	3059	13.17	30	10.48
	3060	11.63	40	10.15
GEM030555	1100	9.43	30	9.94
	1101	4.24	40	9.46
GEM030556	1072	8.69	20	9.25
	1073	9.07	30	9.89
GEM030557	1021	10.39	20	6.04
	1022	10.19	20	8.74
GEM030558	1032	11.86	30	9.09
	1033	10.42	30	8.87
GEM030559	2137	7.17	70	13.41
	2138	4.59	60	12.94
GEM030560	2061	9.84	30	9.9
	2062	8.2	40	10.4
GEM030561	1094	5.61	60	9.22
	1095	4.86	60	10.23
GEM030562	3063	6.97	60	10.93
	3064	5.18	70	10.16
GEM030563	2007	12.68	10	9.59
	2008	8.62	20	6.52
GEM030564	2189	5.38	70	11.96
	2190	7.72	70	13.93
GEM030565	2081	6.85	50	11.02
	2082	6.31	60	10.83
	2084	5.28	40	10.69
	2086	8	50	11.63
	2087	6.04	40	11.04
	2088	7.49	50	11.54
GEM030566	3213	5.76	80	14.57
	3214	5.73	90	14.68
GEM030567	2033	6.16	70	9.24
	2034	5.53	70	9.44
GEM030568	3215	9	110	14.55
	3217	9.96	110	14.2
GEM030569	3061	4.61	40	8.8
	3062	6.14	40	9.75
GEM030570	3047	7.22	70	9.25
	3048	6.12	70	9.07
GEM030571	3035	8.32	50	9.23
	3036	6.27	60	8.53
GEM030572	2025	4.21	60	7.23
	2026	5	50	8.27

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030573	3027	3.74	70	7.79
	3029	6.15	50	8.56
GEM030574	2242	6.65	90	14.28
	2243	8.19	100	14.29
GEM030576	1126	8.24	70	11.78
	1127	10.18	60	11.47
GEM030577	3003	11.31	30	8.4
	3004	10.01	30	8.76
GEM030578	1243	6.52	100	11.22
	1244	6.93	70	13.16
GEM030579	1108	2.32	60	9.33
	1109	8.52	10	9.3
GEM030580	2017	11.22	30	9.17
	2018	9.29	40	5.86
GEM030581	2185	10.7	80	10.54
	2188	8.62	70	13.61
	2189	5.38	70	11.96
GEM030582	1262	7.32	90	13.4
	1263	8.47	110	13.59
	1264	7.07	90	13.7
	1265	5.78	110	13.35
	1266	6.26	110	13.82
	1267	5.78	100	14.01
	1270	8.27	110	14.26
GEM030583	2214	3.06	100	11.5
	2215	4.36	110	12.48
GEM030584	2248	12.15	120	12.5
	2249	6.21	80	14.25
GEM030585	3203	5.6	80	13.71
	3204	6.66	80	14.54
GEM030586	2113	8.82	70	13.56
	2114	10.3	60	13.44
GEM030587	1092	8.7	70	9.34
	1093	6.07	60	9.73
GEM030588	1136	6.34	40	11.65
	1137	6.09	60	11.48
	1138	9.45	40	12.22
	1139	10.65	30	12.67
	1140	7.33	40	12.17
	1141	7.58	30	12.07
	1142	7.96	40	12.74
	1143	4.97	50	11.35

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
	1144	7.49	50	12.59
	1145	8.52	70	12.48
	1146	7.28	70	12.15
	1147	8.6	40	13.3
	1148	7.45	40	13.05
	1149	7.7	70	12.54
	1150	5.39	50	11.1
	1151	2.99	60	9.18
GEM030589	3008	8.01	50	7.44
	3009	7.1	40	8.25
	3050	6.79	10	9.34
	3056	10.93	10	9.58
	3057	11.63	40	10.4
	3059	13.17	30	10.48
	3060	11.63	40	10.15
GEM030590	1006	5.46	15	5.95
	1008	4.15	60	7.57
	1012	8.45	30	7.91
	1018	10.44	20	7.55
	1025	8.14	30	7.87
	1032	11.86	30	9.09
GEM030591	2244	9.89	110	14.76
	2245	11.54	140	9.67
GEM030592	1331	5.08	90	13.75
	1332	5.23	90	14.5
GEM030593	3195	7.06	110	14.23
	3196	13.67	140	10.42
GEM030594	1279	9.11	110	14.37
	1281	9.42	110	14.79
	1282	9.55	110	14.62
	1287	6.1	70	14.01
	1288	4.93	100	13.48
	1289	5.35	90	13.77
GEM030595	3221	10.28	140	9.53
	3223	10.7	140	10.04
GEM030596	N/A ^b	N/A ^b	N/A ^b	N/A ^b
GEM030597	3098	9.35	70	14.55
	3100	5.85	40	13.35
GEM030598	2155	10.29	70	15.73
	2156	8.23	70	15.79
GEM030599	3124	8.75	70	15.41
	3125	9.73	60	15.7

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030600	1209	5.99	60	14.74
	1210	11.18	90	9.47
GEM030601	1276	8.69	120	8.69
	1278	9.42	110	13.67
GEM030602	2205	8.81	120	12.47
	2206	6.18	80	12.98
GEM030603	3156	4.46	90	11.58
	3157	7.17	80	13.9
	3159	6.73	80	13.92
	3161	8.61	90	13.61
	3163	4.74	70	13.74
	3164	6.09	70	14.08
	3167	10.96	110	14.96
GEM030604	1253	2.45	50	12.41
	1254	6.37	70	13.86
GEM030605	1245	5.88	70	13.27
	1246	7.12	80	13.06
GEM030606	3171	8.6	110	13.72
	3172	9.77	110	14.05
GEM030607	3177	9.97	100	14.57
	3178	9.81	100	14.79
GEM030608	2207	6.81	110	12.72
	2208	7.56	90	13.24
GEM030609	1297	7.35	70	14.43
	1298	7.75	70	14.77
GEM030610	1307	6.02	80	13.57
	1308	14.44	130	8.58
GEM030611	1030	9.25	20	8.64
	1031	9.57	20	9.45
GEM030612	1026	10.15	40	8.34
	1027	5.22	70	7.92
GEM030613	2013	2	70	7.21
	2014	8.82	20	8.26
GEM030614	3019	3.42	10	7.41
	3020	3.05	10	7.86
GEM030615	1036	5.75	40	8.45
	1037	8.9	40	9.35
GEM030616	1042	9.05	30	9.39
	1043	7.46	40	8.71
GEM030617	1301	6.24	80	14.14
	1302	6.96	80	14.55

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030618	2009	8.73	30	9.19
	2010	9.23	30	6.34
GEM030619	1096	8.54	50	8.53
	1097	6.92	50	10
GEM030620	3201	7.68	110	14.2
	3202	5.49	80	13.26
GEM030621	1114	4.8	40	9.51
	1115	4.77	50	10
GEM030622	1061	3.54	50	8.35
	1063	6.82	50	9.38
	1076	12.76	40	10.48
	1090	6	40	10.1
GEM030623	1082	9.53	30	9.71
	1083	4.88	40	8.93
GEM030624	1102	8.39	70	10.97
	1103	8.52	70	10.84
GEM030625	3165	5.41	90	11.97
	3166	6.78	110	11.84
GEM030626	1292	10.07	90	15.25
	1293	10.92	110	15.16
	1294	11.05	90	14.6
	1296	6.91	100	13.92
	1297	7.35	70	14.43
	1298	7.75	70	14.77
	1299	6.65	80	13.81
	1300	8.33	80	14.99
	1301	6.24	80	14.14
	1302	6.96	80	14.55
	1305	11.76	140	9.95
	1306	10.74	140	9.96
GEM030627	2065	4.27	60	9.29
	2066	2.19	60	8.73
GEM030628	1106	3.83	70	9.27
	1107	4.16	60	9.33
GEM030629	3198	13.94	120	9.29
	3200	7.39	110	13.92
GEM030630	1122	6.5	60	11.07
	1123	10.28	30	11.12
GEM030631	2091	6.54	50	12.03
	2092	6.56	60	11.66
GEM030632	1023	10.1	30	8.24

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
GEM030633	3159	6.73	80	13.92
	3160	8.57	100	13.65
GEM030634	1273	7.97	110	13.41
	1274	4.13	110	11.93
GEM030635	1158	8.33	70	13.24
	1159	7.86	70	13.14
	1160	7.59	60	13.18
	1161	9.24	50	13.92
	1162	6.84	30	13.33
	1163	7.61	70	13.23
GEM030636	1138	9.45	40	12.22
	1139	10.65	30	12.67
GEM030637	3091	7.83	50	13.3
	3092	8.5	50	14.46
GEM030638	3093	8.44	60	14.49
	3095	7.76	70	13.89
GEM030639	1011	8.38	20	8.2
	1014	7.68	50	8.19
GEM030640	1070	11.36	20	9.66
	1071	11.31	20	9.84
GEM030641	3005	8.83	40	8.46
	3006	11.78	50	8.19
GEM030642	1077	8.09	40	10.34
	1081	4	60	9.15
GEM030643	3025	9.99	50	8.81
	3026	4.31	70	7.96
GEM030644	1064	6.63	40	9.3
	1065	5.99	50	9.39
GEM030645	1044	7.87	40	6.03
	1045	6.44	40	8.84
GEM030649	2223	8.11	100	14.85
	2224	9.31	100	14.91
	2226	8.35	100	10.56
	2229	13.61	100	12.53
	2232	9.72	90	14.82
	2234	12.51	100	14.23
	2235	10.07	90	14.74
	2236	11.04	80	14.67
	2237	12.12	140	9.3
	2238	9.75	140	9.49
	2239	7.99	90	14.69
	2242	6.65	90	14.28

Table G-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (degrees)	Depth (ft)
	2243	8.19	100	14.29
	2245	11.54	140	9.67
	2247	13.09	140	9.57
	2249	6.21	80	14.25
	2250	6.53	90	13.91
	2252	7.32	110	10.83
	2253	7.32	110	10.83
GEM030650	2109	6.82	50	12.69
	2110	7.87	50	13.23
	2112	6.68	60	12.68
	2113	8.82	70	13.56
	2114	10.3	60	13.44
	2115	5.96	70	12.82
	2116	4.1	50	12.17
	2117	7.18	70	13.12
	2118	8.52	30	14.19
	2119	8.31	60	13.52
	2120	8.42	60	14.08
	2121	8.73	60	14.5
	2123	7.62	50	13.55
GEM030671	3175	5.32	100	13.61
	3176	9.13	110	14.79
GEM030672	2222	10.2	110	14.76
	2223	8.11	100	14.85
GEM030673	3191	8.72	80	14.81
	3192	8.86	90	14.81
GEM030674	1295	11.88	140	7.84
	1296	6.91	100	13.92
GEM030675	2246	13.2	130	9.48
	2247	13.09	140	9.57
GEM030676	3193	8	110	14.12
	3194	6.62	80	13.99
GEM030677	2218	9.02	100	14.03
	2219	9.03	110	13.92
GEM030678	2220	9.43	110	14.66
	2221	9.42	110	14.31
a. Scoop 2080 contained debris that was collected from multiple locations within the retrieval area.				
b. Not applicable – Drum GEM030596 contains secondary waste removed from Packaging Glovebox System #1. No retrieved waste from Pit 9 was placed in this drum.				



Appendix H

Fissile Material Monitoring Results

Appendix H

Fissile Material Monitoring Results

Table H-1 contains a summary of the suspect fissile material measured in the OU 7-10 Glovebox Excavator Method Project fissile material monitors (FMMs) during retrieval operations. The table contains the identification number of the drum into which waste scoops were placed, the number of scoops placed into each drum, and the FMM fissile gram equivalent measurement. When operators placed suspect fissile material into a bucket for measurement, the waste was identified as being debris, soil, or sludge. Therefore, there are two categories of FMM measurements (i.e., two columns of FMM data).

The data indicate that each system arrived at a value (within its uncertainty) within the value of the other system (within its uncertainty). Given the variations and uncertainties associated with these devices, the operation's limit of loading a drum with no more than 100 fissile gram equivalent of known fissile material (i.e., fissile material measured by the FMM) was appropriate, and the FMM provided the Project with a risk-mitigation tool to avoid overloading a drum.

Table H-1. Summary of the suspect fissile material measured in the glovebox fissile material monitors during retrieval operations.

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (in degrees)	Depth (ft)	Debris FGE (plus 1 sigma uncertainty)	Soil/Sludge FGE (plus 1 sigma uncertainty)	Total FGE (plus 1 sigma uncertainty)
GEM030034	2166	9.40	100	9.49	NA	NA	0.070
	2167	6.51	100	9.26	NA	NA	
	2169	7.16	100	9.90	NA	NA	
	2170	4.72	90	9.72	NA	NA	
	2174	5.67	60	13.39	NA	NA	
	2175	4.90	70	12.71	NA	NA	
	2181	5.88	70	13.27	0.070	NA	
	2183	7.78	70	12.53	NA	NA	
	2184	10.34	80	10.70	NA	NA	
GEM030041	2186	11.55	90	10.58	NA	NA	0.002
	2005	11.93	40	8.59	NA	NA	
	2008	8.62	20	6.52	NA	NA	
	2029	8.66	60	9.51	NA	NA	
	2030	6.46	60	9.58	NA	NA	
	2036	3.75	60	9.40	NA	NA	
	2037	3.69	40	8.90	NA	NA	
	2039	9.64	20	9.26	NA	NA	
	2048	9.98	30	10.18	NA	NA	
	2057	9.99	40	9.87	0.001	NA	
	2058	9.31	40	10.75	NA	NA	
	2059	8.85	40	11.12	NA	NA	
	2060	6.13	60	10.85	NA	NA	
	2062	8.20	40	10.40	NA	NA	
	2065	4.27	60	9.29	0.001	NA	
GEM030047	2072	6.27	50	8.14	NA	NA	0.002
	2073	5.72	40	10.04	0.002	NA	
	2074	6.27	50	8.14	NA	NA	
	2075	4.22	40	9.92	NA	NA	
	2076	11.35	50	11.65	NA	NA	
	2077	4.44	70	9.62	NA	NA	
	2078	11.39	50	11.70	NA	NA	
	2079	10.23	40	11.98	NA	NA	
	2080 ^a	9.78	40	11.25	NA	NA	
	2080 ^a	8.70	60	11.02	NA	NA	
	2080 ^a	8.10	60	10.76	NA	NA	

Table H-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (in degrees)	Depth (ft)	Debris FGE (plus 1 sigma uncertainty)	Soil/Sludge FGE (plus 1 sigma uncertainty)	Total FGE (plus 1 sigma uncertainty)
GEM030049	2206	6.18	80	12.98	NA	NA	38.510
	2207	6.81	110	12.72	NA	NA	
	2210	7.63	90	13.92	NA	NA	
	2211	7.18	90	14.09	NA	NA	
	2212	9.98	90	11.84	10.830	NA	
	2213	9.98	90	11.84	27.680	NA	
GEM030072	1242	7.27	100	10.64	NA	NA	0.031
	1243	6.52	100	11.22	NA	NA	
	1244	6.93	70	13.16	0.030	NA	
	1245	5.88	70	13.27	NA	NA	
	1246	7.12	80	13.06	NA	NA	
	1247	6.42	90	12.86	0.001	NA	
GEM030086	1251	8.29	90	13.99	NA	NA	0.001
	1252	6.60	80	13.66	NA	NA	
	1253	2.45	50	12.41	0.001	NA	
	1254	6.37	70	13.86	NA	NA	
	1255	4.81	70	13.48	0.000	NA	
	1257	4.85	70	13.31	NA	NA	
GEM030150	1162	6.84	30	13.33	NA	NA	0.000
	1163	7.61	70	13.23	NA	0.000	
GEM030212	1248	4.63	90	11.79	0.001	NA	0.001
	1249	6.86	100	12.81	NA	NA	
	1250	8.58	80	14.18	NA	NA	
GEM030217	3137	6.97	110	9.21	NA	NA	0.450
	3139	8.48	100	10.09	NA	NA	
	3141	8.57	100	10.52	NA	NA	
	3147	5.87	60	13.68	NA	NA	
	3148	5.28	80	13.06	NA	NA	
	3152	9.98	90	11.84	0.200	NA	
	3153	8.45	70	11.96	NA	NA	
	3154	8.01	70	13.14	NA	NA	
	3155	6.91	70	12.50	0.250	NA	
GEM030221	2089	7.50	50	12.02	NA	NA	0.010
	2090	7.42	60	12.24	0.010	NA	
	2091	6.54	50	12.03	NA	NA	
	2092	6.56	60	11.66	NA	NA	
	2093	7.43	70	12.02	NA	NA	
	2094	10.23	30	12.58	NA	NA	

Table H-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (in degrees)	Depth (ft)	Debris FGE (plus 1 sigma uncertainty)	Soil/Sludge FGE (plus 1 sigma uncertainty)	Total FGE (plus 1 sigma uncertainty)
GEM030226	3168	7.95	90	13.88	NA	NA	0.013
	3171	8.60	110	13.72	NA	NA	
	3179	9.41	100	14.78	NA	NA	
	3181	8.20	80	14.49	NA	NA	
	3183	8.21	80	14.38	0.010	NA	
	3184	8.38	80	14.37	0.003	NA	
	3185	6.93	70	14.21	NA	NA	
	3188	5.61	100	13.34	NA	NA	
GEM030235	1145	8.52	70	12.48	NA	NA	0.010
	1146	7.28	70	12.15	NA	0.010	
GEM030237	1048	3.64	70	7.87	NA	NA	0.000
	1049	5.80	40	8.58	NA	0.000	
GEM030243	2097	5.79	40	11.97	NA	NA	0.080
	2098	9.74	70	13.01	NA	0.080	
GEM030364	2255	5.21	70	13.92	NA	NA	22.050
	2256	7.02	110	13.42	NA	NA	
	2257	5.83	110	14.13	22.050	NA	
GEM030365	1329	5.69	80	14.50	NA	NA	0.560
	1330	5.71	80	14.72	NA	NA	
	1332	5.23	90	14.50	NA	NA	
	1333	6.71	110	14.11	NA	NA	
	1335	8.47	110	15.40	NA	NA	
	1338	9.19	90	14.99	0.000	NA	
	1339	8.14	110	16.00	0.560	NA	
	1340	9.89	110	13.54	NA	NA	
GEM030436	2254	6.82	110	13.86	94.680	NA	94.680
	2255	5.21	70	13.92	NA	NA	
GEM030438	2252	7.32	110	10.83	NA	NA	76.820
	2253	7.32	110	10.83	76.820	NA	
GEM030526	3192	8.86	90	14.81	NA	NA	0.070
	3193	8.00	110	14.12	NA	NA	
	3194	6.62	80	13.99	NA	NA	
	3203	5.60	80	13.71	NA	NA	
	3204	6.66	80	14.54	NA	NA	
	3205	5.69	90	13.20	NA	NA	
	3207	5.28	80	14.50	NA	NA	
	3208	6.42	90	13.96	NA	NA	
	3209	6.74	80	14.70	0.070	NA	
GEM030528	2256	7.02	110	13.42	NA	NA	79.200
	2257	5.83	110	14.13	NA	79.200	

Table H-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (in degrees)	Depth (ft)	Debris FGE (plus 1 sigma uncertainty)	Soil/Sludge FGE (plus 1 sigma uncertainty)	Total FGE (plus 1 sigma uncertainty)
GEM030531	1307	6.02	80	13.57	NA	NA	12.520
	1312	6.36	70	13.76	NA	NA	
	1313	6.37	70	14.17	NA	NA	
	1315	5.40	80	14.12	NA	NA	
	1317	5.44	70	13.81	0.060	NA	
	1322	8.88	110	13.15	NA	NA	
	1323	7.32	110	10.83	NA	NA	
	1325	10.26	110	12.96	12.430	NA	
	1326	5.62	80	14.46	NA	NA	
	1327	6.64	80	14.28	NA	NA	
	1328	6.15	80	14.24	0.030	NA	
GEM030581	2185	10.70	80	10.54	NA	NA	0.100
	2188	8.62	70	13.61	0.000	NA	
	2189	5.38	70	11.96	0.100	NA	
GEM030594	1279	9.11	110	14.37	NA	NA	2.230
	1281	9.42	110	14.79	NA	NA	
	1282	9.55	110	14.62	NA	NA	
	1287	6.10	70	14.01	1.070	NA	
	1288	4.93	100	13.48	NA	NA	
	1289	5.35	90	13.77	1.160	NA	
GEM030626	1292	10.07	90	15.25	NA	NA	0.180
	1293	10.92	110	15.16	NA	NA	
	1294	11.05	90	14.60	NA	NA	
	1296	6.91	100	13.92	NA	NA	
	1297	7.35	70	14.43	NA	NA	
	1298	7.75	70	14.77	NA	NA	
	1299	6.65	80	13.81	NA	NA	
	1300	8.33	80	14.99	NA	NA	
	1301	6.24	80	14.14	NA	NA	
	1302	6.96	80	14.55	NA	NA	
	1305	11.76	140	9.95	0.120	NA	
	1306	10.74	140	9.96	0.060	NA	
GEM030649	2223	8.11	100	14.85	NA	NA	79.620
	2224	9.31	100	14.91	NA	NA	
	2226	8.35	100	10.56	NA	NA	
	2229	13.61	100	12.53	0.200	NA	
	2232	9.72	90	14.82	NA	NA	
	2234	12.51	100	14.23	NA	NA	
	2235	10.07	90	14.74	NA	NA	
	2236	11.04	80	14.67	NA	NA	
	2237	12.12	140	9.30	0.020	NA	

Table H-1. (continued).

Drum Identification No.	Scoop/Cart Number	Reach (ft)	Angle (in degrees)	Depth (ft)	Debris FGE (plus 1 sigma uncertainty)	Soil/Sludge FGE (plus 1 sigma uncertainty)	Total FGE (plus 1 sigma uncertainty)
	2238	9.75	140	9.49	NA	NA	
	2239	7.99	90	14.69	NA	NA	
	2242	6.65	90	14.28	NA	NA	
	2243	8.19	100	14.29	NA	NA	
	2245	11.54	140	9.67	0.900	NA	
	2247	13.09	140	9.57	NA	NA	
	2249	6.21	80	14.25	NA	NA	
	2250	6.53	90	13.91	NA	NA	
	2252	7.32	110	10.83	0.010	NA	
	2253	7.32	110	10.83	78.490	NA	
a. Scoop 2080 contained debris that was collected from multiple locations within the retrieval area.							



Appendix I

Project Completion Confirmation Letters

Appendix I

Project Completion Confirmation Letters

On February 24, 2004, the U.S. Department of Energy (DOE) Idaho Operations Office notified the U.S. Environmental Protection Agency (EPA) and the Idaho Department of Environmental Quality (DEQ) of the completion of waste retrieval for the OU 7-10 Glovebox Excavator Method Project. Both EPA and Idaho DEQ acknowledged that DOE Idaho Operations Office had met the requirements set forth in Paragraph 3.1.7 of the *Agreement to Resolve Disputes* (DOE-ID 2002). This paragraph required (1) the Stage II excavation to be completed by no later than October 31, 2004, and (2) the submittal of the notification of Completion of Stage II excavation by the DOE Idaho Operations Office. Copies of the three letters are contained in this appendix.



Department of Energy

Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, ID 83401

February 24, 2004

Daryl F. Koch, Acting Remediation Manager
Waste Management and Remediation Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

Nicholas Ceto, INEEL Project Manager
Environmental Protection Agency Region 10
712 Swift Blvd., Suite 5
Richland, WA 99352

SUBJECT: Completion of Excavation Operations at the Glovebox Excavator Method (GEM)
Project - (EM-ER-04-042)

Dear Mr. Koch and Mr. Ceto:

On February 22, the GEM project completed retrieval of waste per INEEL/EXT-02-00703, *Excavation Plan and Sequential Process Narrative for the OU 7-10 Glovebox Excavator Method Project*. This meets the requirement of milestone 3.1.7 of the *Agreement to Resolve Disputes* (ARD). Per paragraph 3.4.4.C.i. of the ARD, the Idaho Department of Environmental Quality and the Environmental Protection Agency are requested to authorize release of the remaining \$2 million held in reserve.

Please contact me at 208-526-5920 if you have any questions.

Sincerely,

Jeff Snook, Manager
WAG 7



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706-1255 • (208) 373-0502

Dirk Kempthorne, Governor
C. Stephen Allred, Director

February 24, 2004

Jeff Snook
US Department of Energy
1955 Fremont Avenue
Idaho Falls, Idaho 83401

Subject: Response to Letter Regarding Completion of Excavation Operations at the
Glovebox Excavator Method (GEM) Project.

Dear Mr. Snook:

The Idaho Department of Environmental Quality has received your February 24, 2004 request for release of the remaining \$2 million dollars being held in reserve until completion of the of Excavation Operations at the GEM Project.

The Department hereby authorizes this request as you appear to have met the requirements of milestone 3.1.7 of the Agreement to Resolve Disputes.

Sincerely,

A handwritten signature in black ink, appearing to read "Daryl F. Koch".

Daryl F. Koch
Acting Remediation Manager
Waste Management & Remediation Division

DFK:tg c:\...daryl\final \$2m release.doc

cc: Nick Ceto, USEPA
Darrell Early, Deputy Attorney General
Kathleen Trever, INEEL Oversight
Orville Green, Administrator WM&R
Source File
COF





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 RICHLAND OFFICE
712 Swift Boulevard, Suite 5
Richland, Washington 99352

February 24, 2004

Jeff Snook, Manager
WAG 7
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive
Idaho Falls, ID 83401

Re: Completion of Excavation Operations in the Glovebox Excavator Method (GEM) Project
(EM-ER-04-042)

Dear Mr. Snook:

The U.S. Environmental Protection Agency (EPA) agrees that you have met the requirement of milestone 3.1.7 of the *Agreement to Resolve Disputes*. Therefore, EPA authorizes release of the remaining \$2 million held in reserve.

If you have any questions, please contact me at (509)376-9529.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Ceto".

Nicholas Ceto, Program Manager
INEEL Project

cc: Daryl Koch, IDEQ